# SECTION 1

# SUMMARY

## CONTENTS

**PRODUCT SAFETY SERVICING GUIDELINES FOR VIDEO PRODUCTS ..... 1-3**
**SERVICING PRECAUTIONS ..... 1-4**
- **General Servicing Precautions**
- **Insulation Checking Prodedure**
- **Electrostatically Sensitive Devices**

**SPECIFICATIONS ..... 1-5**

# PRODUCT SAFETY SERVICING GUIDELINES FOR VIDEO PRODUCTS

CAUTION : DO NOT ATTEMPT TO MODIFY THIS PRODUCT IN ANY WAY, NEVER PERFORM CUSTOMIZED INSTALLATIONS WITHOUT MANUFACTURER'S APPROVAL. UNAUTHORIZED MODIFICATIONS WILL NOT ONLY VOID THE WARRANTY, BUT MAY LEAD TO YOUR BEING LIABLE FOR ANY RESULTING PROPERTY DAMAGE OR USER INJURY.

SERVICE WORK SHOULD BE PERFORMED ONLY AFTER YOU ARE THOROUGHLY FAMILIAR WITH ALL OF THE FOLLOWING SAFETY CHECKS AND SERVICING GUIDELINES. TO DO OTHERWISE, INCREASES THE RISK OF POTENTIAL HAZARDS AND INJURY TO THE USER.

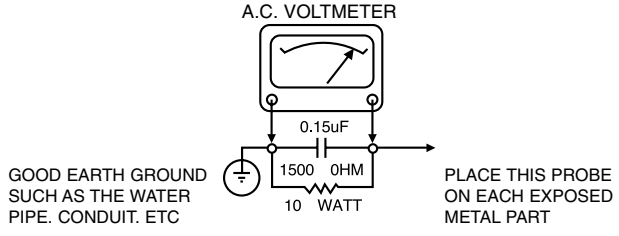
WHILE SERVICING, USE AN ISOLATION TRANSFORMER FOR PROTECTION FROM A.C. LINE SHOCK.

**SAFETY CHECKS**

AFTER THE ORIGINAL SERVICE PROBLEM HAS BEEN CORRCTED. A CHECK SHOULD BE MADE OF THE FOLLOWING.

**SUBJECT : FIRE & SHOCK HAZARD**

1. BE SURE THAT ALL COMPONENTS ARE POSITIONED IN SUCH A WAY AS TO AVOID POSSIBILITY OF ADJACENT COMPONENT SHORTS. THIS IS ESPECIALLY IMPORTANT ON THOSE MODULES WHICH ARE TRANSPORTED TO AND FROM THE REPAIR SHOP.
2. NEVER RELEASE A REPAIR UNLESS ALL PROTECTIVE DEVICES SUCH AS INSULATORS, BARRIERS, COVERS, SHIELDS, STRAIN RELIEFS, POWER SUPPLY CORDS, AND OTHER HARDWARE HAVE BEEN REINSTALLED PER ORIGINAL DESIGN. BE SURE THAT THE SAFETY PURPOSE OF THE POLARIZED LINE PLUG HAS NOT BEEN DEFEATED.
3. SOLDERING MUST BE INSPECTED TO DISCOVER POSSIBLE COLD SOLDER JOINTS, SOLDER SPLASHES OR SHARP SOLDER POINTS. BE CERTAIN TO REMOVE ALL LOOSE FOREIGN PARTICLES.
4. CHECK FOR PHYSICAL EVIDENCE OF DAMAGE OR DETERIORATION TO PARTS AND COMPONENTS. FOR FRAYED LEADS, DAMAGED INSULATION (INCLUDING A.C. CORD). AND REPLACE IF NECESSARY FOLLOW ORIGINAL LAYOUT, LEAD LENGTH AND DRESS.
5. NO LEAD OR COMPONENT SHOULD TOUCH A RECIVING TUBE OR A RESISTOR RATED AT 1 WATT OR MORE. LEAD TENSION AROUND PROTRUNING METAL SURFACES MUST BE AVOIDED.
6. ALL CRITICAL COMPONENTS SUCH AS FUSES, FLAMEPROOF RESISTORS, CAPACITORS, ETC. MUST BE REPLACED WITH EXACT FACTORY TYPES, DO NOT USE REPLACEMENT COMPONENTS OTHER THAN THOSE SPECIFIED OR MAKE UNRECOMMENDED CIRCUIT MODIFICATIONS.
7. AFTER RE-ASSEMBLY OF THE SET ALWAYS PERFORM AN A.C. LEAKAGE TEST ON ALL EXPOSED METALLIC PARTS OF THE CABINET, (THE CHANNEL SELECTOR KNOB, ANTENNA TERMINALS. HANDLE AND SCREWS) TO BE SURE THE SET IS SAFE TO OPERATE WITHOUT DANGER OF ELECTRICAL SHOCK. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST USE AN A.C. VOLTMETER, HAVING 5000 OHMS PER VOLT OR MORE SENSITIVITY, IN THE FOLLOWING MANNER; CONNECT A 1500 OHM 10 WATT RESISTOR, PARALLELED BY A .15 MFD. 150.V A.C TYPE CAPACITOR BETWEEN A KNOWN GOOD EARTH GROUND (WATER PIPE, CONDUIT, ETC.) AND THE EXPOSED METALLIC PARTS, ONE AT A TIME. MEASURE THE A.C. VOLTAGE ACROSS THE COMBINATION OF 1500 OHM RESISTOR AND .15 MFD CAPACITOR. REVERSE THE A.C. PLUG AND REPEAT A.C. VOLTAGE MEASUREMENTS FOR EACH EXPOSED METALLIC PART. VOLTAGE MEASURED MUST NOT EXCEED 75 VOLTS R.M.S. THIS CORRESPONDS TO 0.5 MILLIAMP A.C ANY VALUE EXCEEDING THIS LIMIT CONSTITUTES A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED IMMEDIATELY.


A.C. VOLTMETER
0.15uF
1500 0HM
10 WATT
GOOD EARTH GROUND SUCH AS THE WATER PIPE. CONDUIT. ETC
PLACE THIS PROBE ON EACH EXPOSED METAL PART

**SUBJECT: GRAPHIC SYMBOLS**

THE LIGHTNING FLASH WITH APROWHEAD SYMBOL. WITHIN AN EQUILATERAL TRIANGLE, IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF UNINSULATED "DANGEROUS VOLTAGE" THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.

THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.

SUBJECT : X-RADIATION

1. BE SURE PROCEDURES AND INSTRUCTIONS TO ALL SERVICE PERSONNEL COVER THE SUBJECT OF X-RADIATION. THE ONLY POTENTIAL SOURCE OF X-RAYS IN CURRENT T.V. RECEIVERS IS THE PICTURE TUBE. HOWEVER, THIS TUBE DOES NOT EMIT X-RAYS WHEN THE HIGH VOLTAGE IS AT THE FACTORY SPECIFIED LEVEL. THE PROPER VALUE IS GIVEN IN THE APPLICABLE SCHEMATIC. OPERATION AT HIGHER VOLTAGES MAY CAUSE A FAILURE OF THE PICTURE TUBE OR HIGH VOLTAGE SUPPLY AND, UNDER CERTAIN CIRCUMSTANCES, MAY PRODUCE RADIATION IN EXCESS OF DESIRABLE LEVELS.
2. ONLY FACTORY SPECIFIED C.R.T. ANODE CONNECTORS MUST BE USED. DEGAUSSING SHIELDS ALSO SERVE AS X-RAY SHIELD IN COLOR SETS, ALWAYS RE-INSTALL THEM.
3. IT IS ESSNTIAL THAT SERVICE PERSONNEL HAVE AVAILABLE AN ACCURATE AND RELIABLE HIGH VOLTAGE METER. THE CALIBRA TION OF THE METER SHOULD BE CHECKED PERIODICALLY AGAINST A REFERENCE STANDARD, SUCH AS THE ONE AVAILABLE AT YOUR DISTRIBUTOR.
4. WHEN THE HIGH VOLTAGE CIRCUITRY IS OPERATING PROPERLY THERE IS NO POSSIBILITY OF AN X-RADIATION PROBLEM. EVERY TIME A COLOR CHASSIS IS SERVICED. THE BRIGHTNESS SHOULD BE RUN UP AND DOWN WHILE MONITORING THE HIGH VOLTAGE WITH A METER TO BE CERTAIN THAT THE HIGH VOLTAGE DOES NOT EXCEED THE SPECIFIED VALUE AND THAT IT IS REGULATING CORRECTLY, WE SUGGEST THAT YOU AND YOUR SERVICE ORGANIZATION REVIEW TEST PROCEDURES SO THAT VOLTAGE REGULATION IS ALWAYS CHECKED AS A STANDARD SERVICING PROCEDURE. AND THAT THE HIGH VOLTAGE READING BE RECORDER ON EACH CUSTOMER'S INVOICE.
5. WHEN TROUBLESHOOTING AND MAKING TEST MEASUREMENTS IN A PRODUCT WITH A PROBLEM OF EXCESSIVE HIGH VOLTAGE, AVOID BEING UNNECESSARILY CLOSE TO THE PICTURE TUBE AND THE HIGH VOLTAGE SUPPLY. DO NOT OPERATE THE PRODUCT LONGER THAN IS NECESSARY TO LOCATE THE CAUSE OF EXCES SIVE VOLTAGE.
6. REFER TO HV. B+ AND SHUTDOWN ADJUSTMENT PROCEDURES DESCRIBED IN THE APPROPRIATE SCHEMATIC AND DIAGRAMS (WHERE USED).

SUBJECT: IMPLOSION

1. ALL DIRECT VIEWED PICTURE TUBES ARE EQUIPPED WITH AN INTE GRAL IMPLOSION PROTECTION SYSTEM, BUT CARE SHOULD BE TAKEN TO AVOID DAMAGE DURING INSTALLATION, AVOID SCRATCHING THE TUBE. IF SCRATCHED REPLACE IT.
2. USE ONLY RECOMMENDED FACTORY REPLACEMENT TUBES.

SUBJECT : TIPS ON PROPER INSTALLATION

1. NEVER INSTALL ANY PRODUCT IN A CLOSED-IN RECESS, CUBBYHOLE OR CLOSELY FITTING SHELF SPACE. OVER OR CLOSE TO HEAT DUCT, OR IN THE PATH OF HEATED AIR FLOW.
2. AVOID CONDITIONS OF HIGH HUMIDITY SUCH AS: OUTDOOR PATIO INSTALLATIONS WHERE DEW IS A FACTOR, NEAR STEAM RADIATORS WHERE STEAM LEAKAGE IS A FACTOR, ETC.
3. AVOID PALCEMENT WHERE DRAPERIES MAY OBSTRUCT REAR VENTING. THE CUSTOMER SHOULD ALSO AVOID THE USE OF DECORATIVE SCARVES OR OTHER COVERINGS WHICH MIGHT OBSTRUCT VENTILATION.
4. WALL AND SHELF MOUNTED INSTALLATIONS USING A COMMERCIAL MOUNTING KIT. MUST FOLLOW THE FACTORY APPROVED MOUNTING INSTRUCTIONS A PRODUCT MOUNTED TO A SHELF OR PLATFORM MUST RETAIN ITS ORIGINAL FEET (OR THE EQUIVALENT THICKNESS IN SPACERS) TO PROVIDE ADEQUATE AIR FLOW ACROSS THE BOTTOM, BOLTS OR SCREWS USED FOR FASTENERS MUST NOT TOUCH ANY PARTS OR WIRING. PERFORM LEAKAGE TEST ON CUSTOMIZED INSTALLATIONS.
5. CAUTION CUSTOMERS AGAINST THE MOUNTING OF A PRODUCT ON SLOPING SHELF OR A TILTED POSITION, UNLESS THE PRODUCT IS PROPERLY SECURED.
6. A PRODUCT ON A ROLL-ABOUT CART SHOULD BE STABLE ON ITS MOUNTING TO THE CART. CAUTION THE CUSTOMER ON THE HAZARDS OF TRYING TO ROLL A CART WITH SMALL CASTERS ACROSS THRESHOLDS OR DEEP PILE CARPETS.
7. CAUTION CUSTOMERS AGAINST THE USE OF A CART OR STAND WHICH HAS NOT BEEN LISTED BY UNDERWRITERS LABORATORIES, INC. FOR USE WITH THEIR SPECIFIC MODEL OF TELEVISION RECEIVER OR GENERICALLY APPROVED FOR USE WITH T.V.'S OF THE SAME OR LARGER SCREEN SIZE.
8. CAUTION CUSTOMERS AGAINST THE USE OF EXTENSION CORDS, EXPLAIN THAT A FOREST OF EXTENSIONS SPROUTING FROM A SINGLE OUTLET CAN LEAD TO DISASTROUS CONSEQUENCES TO HOME AND FAMILY.

# SERVICING PRECAUTIONS

CAUTION : Before servicing the DVD covered by this service data and its supplements and addends, read and follow the *SAFETY PRECAUTIONS. NOTE* : if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publications, always follow the safety precautions.
*Remembers Safety First:*

**General Servicing Precautions**

1. Always unplug the DVD AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
   (2) Disconnection or reconnecting any internal electrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor.
   **Caution** : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this DVD or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.
   Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with whitch instruments covered by this service manual might be equipped.

5. Do not apply AC power to this DVD and/or any of its electrical assemblies unless all solid-state device heat sinks are cerrectly installed.

6. Always connect test instrument ground lead to the appropriate ground before connection the test instrument positive lead. Always remove the test instrument ground lead last.

**Insulation Checking Procedure**

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter(500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.

**Note 1 :** Accessible Conductive Parts including Metal panels, Input terminals, Earphone jacks, etc.

**Electrostatically Sensitive (ES) Devices**

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grouned-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified a “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protec tive package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

# SECTION 2

# CABINET & MAIN CHASSIS

## CONTENTS


**1. EXPLODED VIEWS ..... 2-2**

**1. Cabinet and Main Frame Section ..... 2-2**

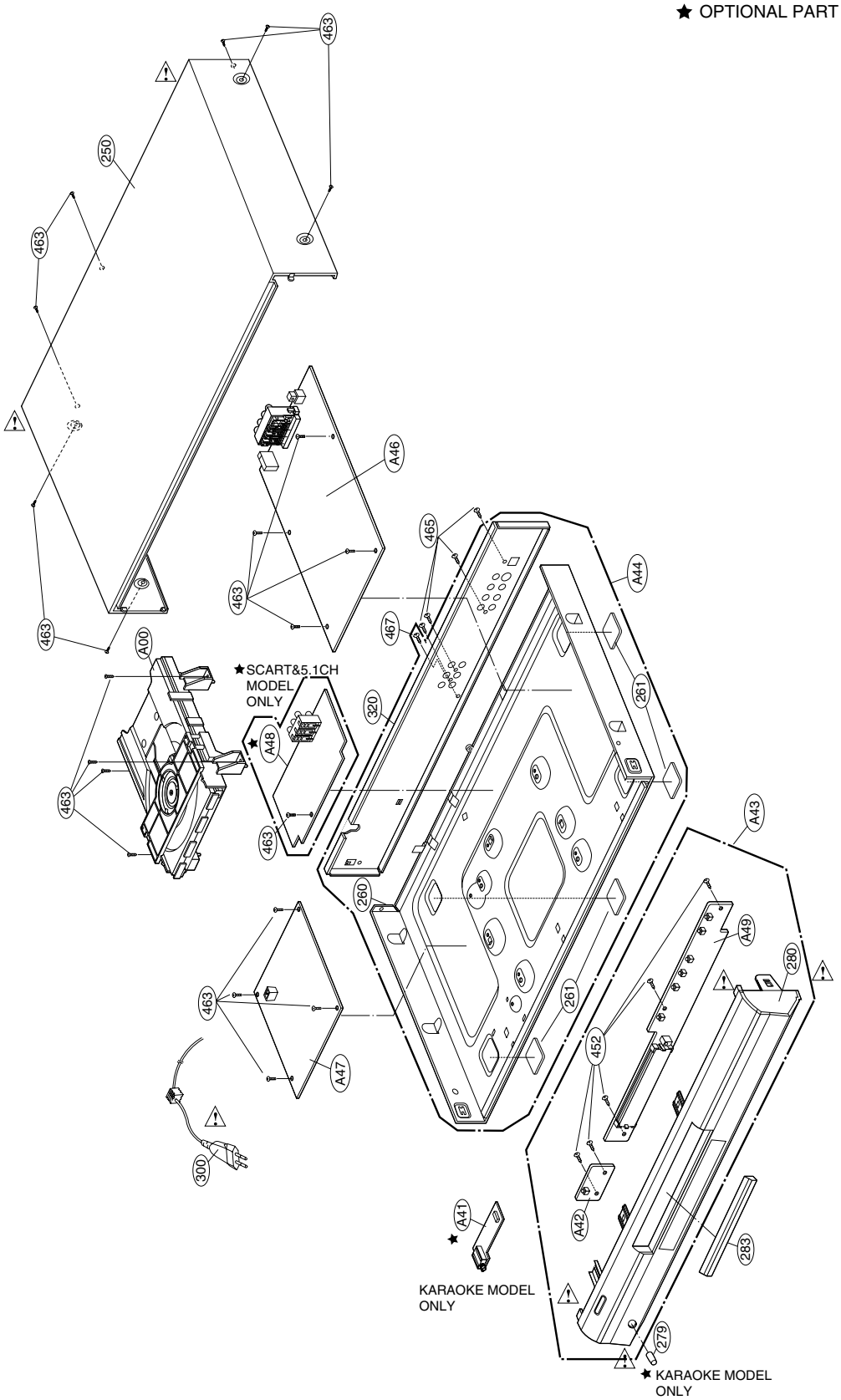
**2. Deck Mechanism Section ..... 2-4**

**3. Packing Accessory Section ..... 2-5**

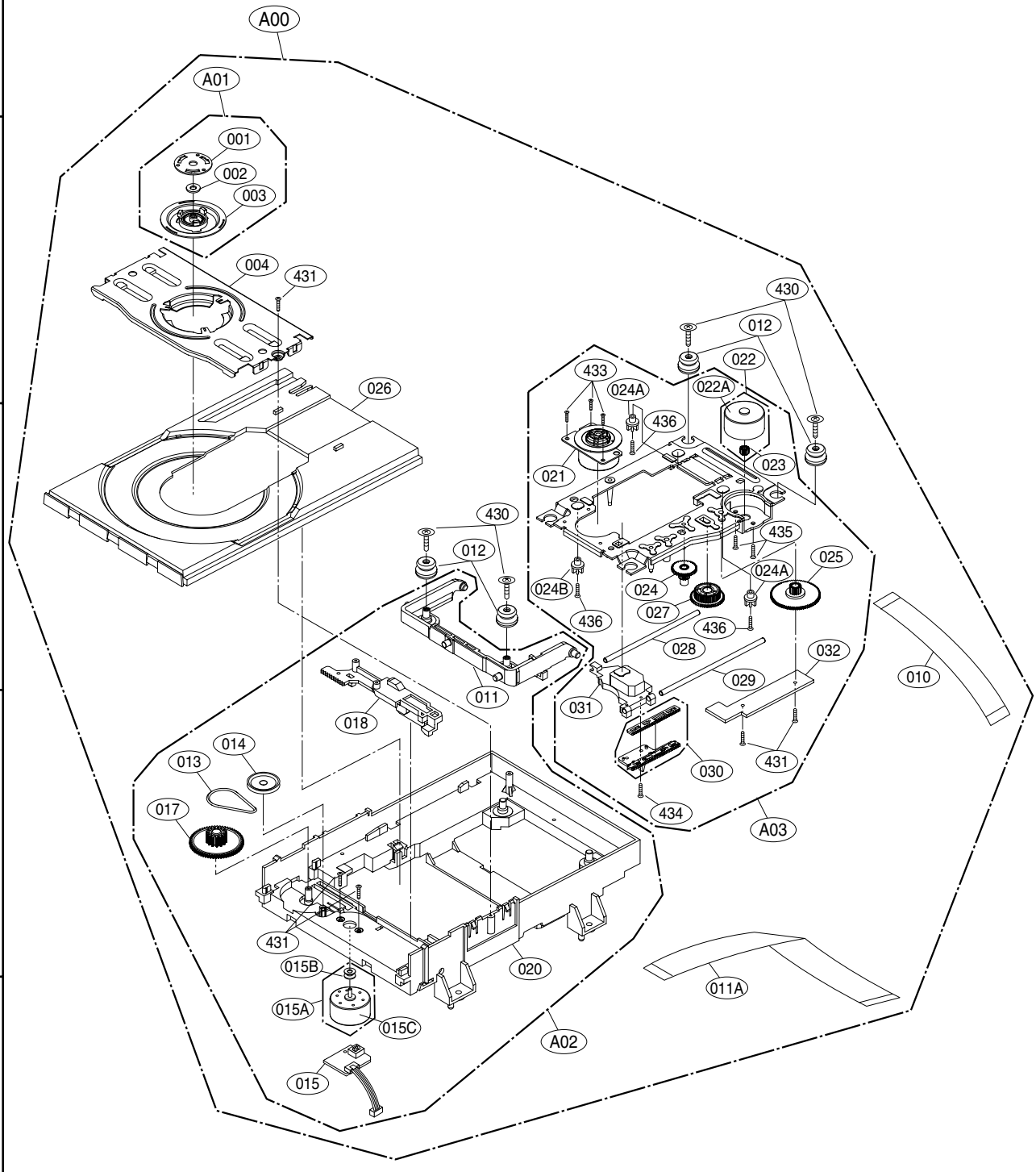
# EXPLODED VIEWS

## 1. Cabinet and Main Frame Section

★ OPTIONAL PART

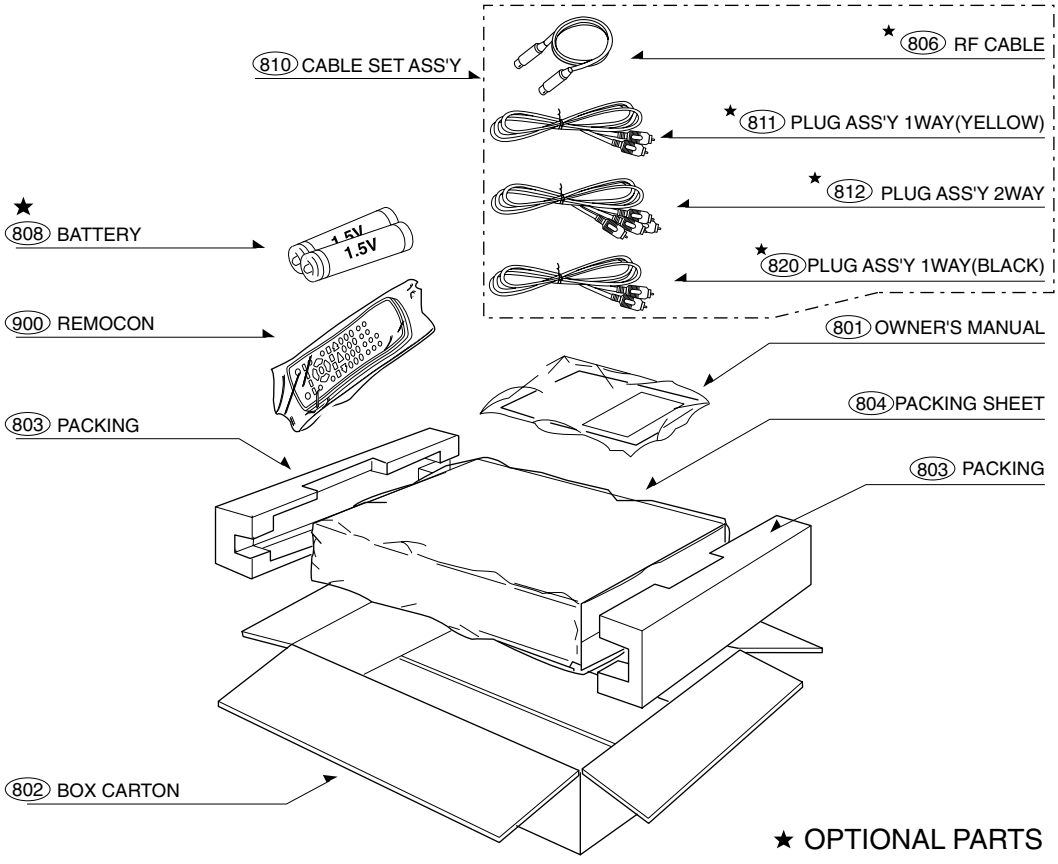


## 2. Deck Mechanism Section




A | B | C | D

## 3. Packing Accessory Section



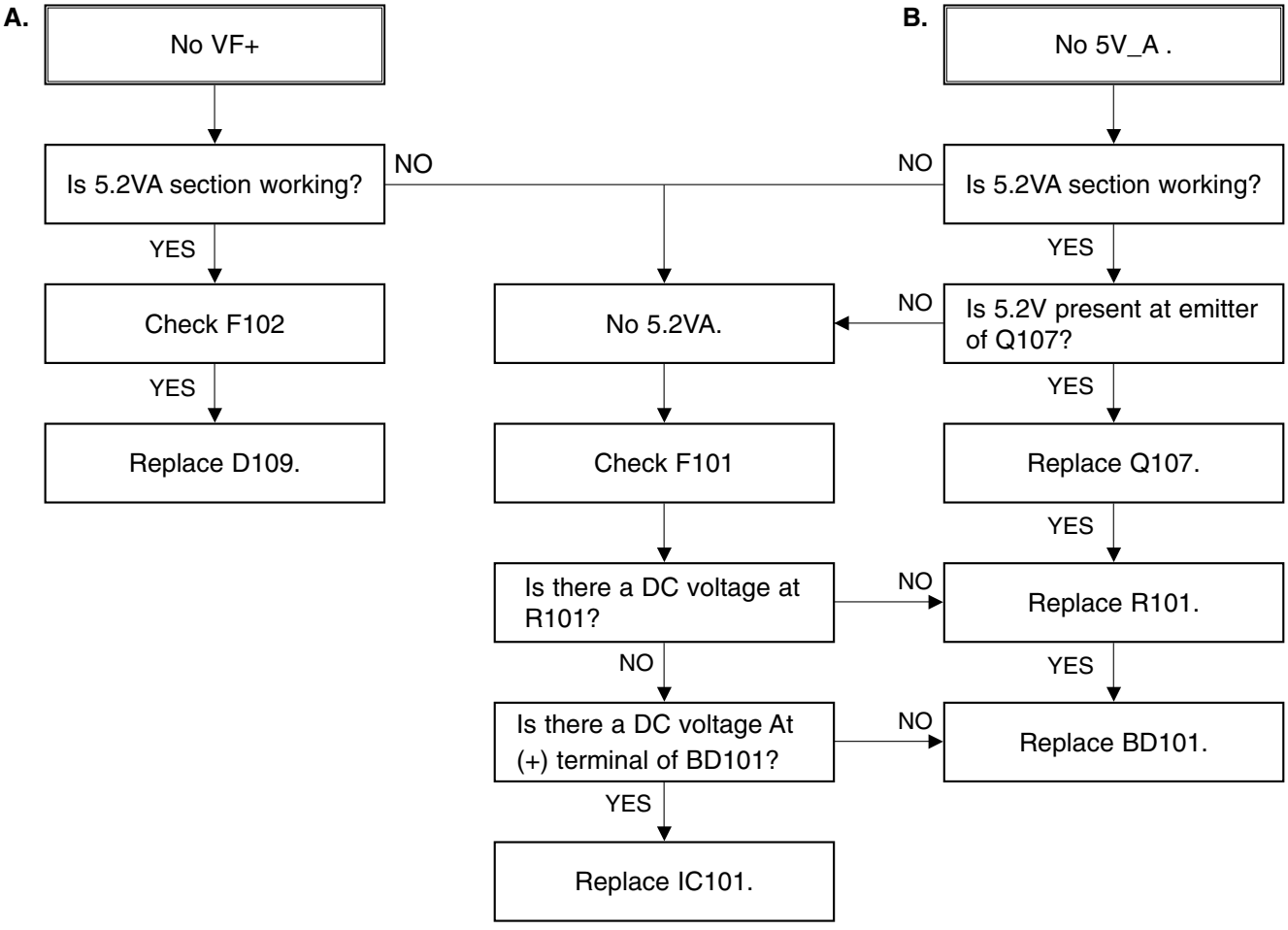
# SECTION 3
# ELECTRICAL

## CONTENTS

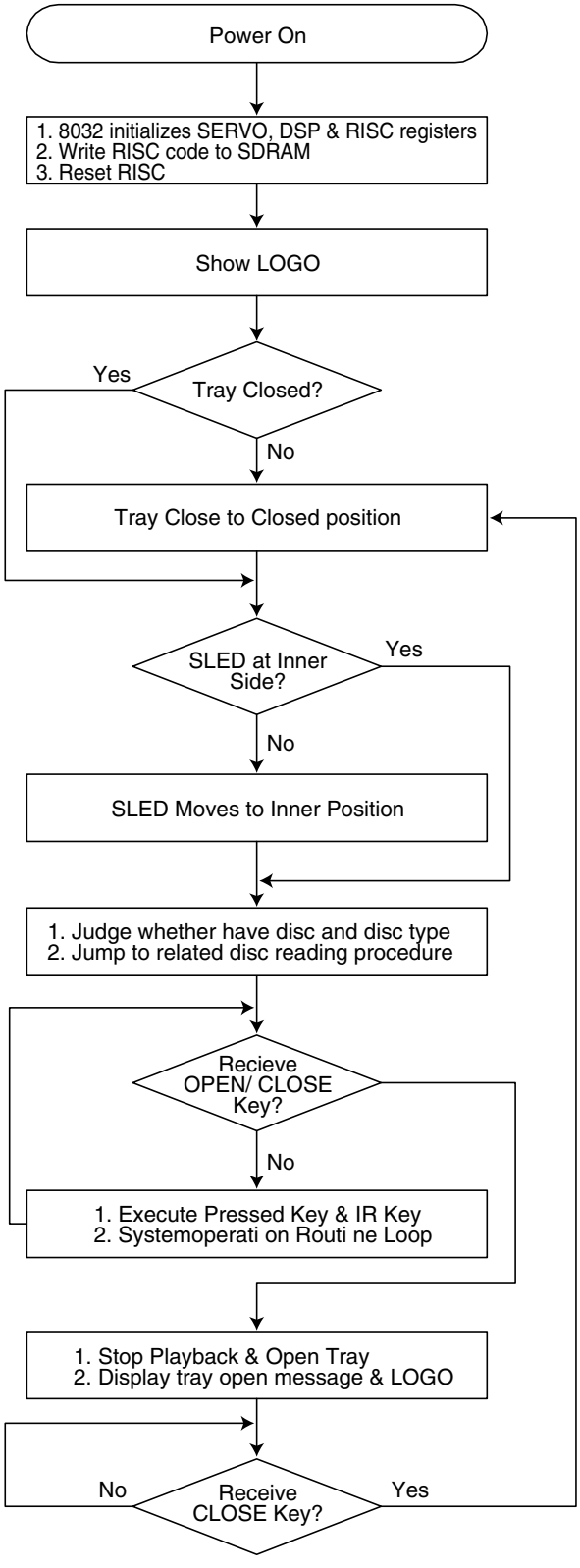

ELECTRICAL TROUBLESHOOTING GUIDE....3-2
1. Power check flow....3-2
2. System operation flow....3-3
3. Test & debug flow....3-4
4. Karaoke flow....3-10
DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING....3-11
1. SYSTEM 27MHz CLOCK,RESET,FLASH R/W SIGNAL....3-11
2. SDRAM CLOCK....3-13
3. TRAY OPEN/CLOSE SIGNAL....3-13
4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)....3-15
5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)....3-15
6. LASER POWER CONTROL RELATED SIGNAL(NO DISC CONDITION)....3-16
7. DISC TYPE JUDGEMENT WAVEFORM....3-16
8. FOCUS ON WAVEFORM....3-18
9. SPINDLE CONTROL WAVEFORM (NO DISC CONDITION)....3-19
10. TRACKING CONTROL RELATED SIGNAL(System checking)....3-20
11. RF WAVEFORM....3-21
12. MT1379 AUDIO OPTICAL AND COAXIAL OUTPUT (ASPDIF)....3-21
13. MT1379 VIDEO OUTPUT WAVEFORM....3-22
14. AUDIO OUTPUT FROM AUDIO DAC....3-23
BLOCK DIAGRAMS....3-25
1. Overall Block Diagram....3-25
2. Power(SMPS) Block Diagram....3-26
3. SERVO Block Diagram....3-27
4. MPEG & MEMORY Block Diagram....3-28
5. VIDEO & AUDIO Block Diagram....3-29
6. Karaoke Block Diagram....3-30
CIRCUIT DIAGRAMS....3-31
1. Power(SMPS) Circuit DIAGRAM....3-31
2. SYSTEM Circuit DIAGRAM....3-33
3. RF & SERVO Circuit DIAGRAM....3-35
4. TIMER, 5.1CH, SCART, KARAOKE Circuit DIAGRAM....3-37
5. AV/JACK Circuit DIAGRAM....3-39
• CIRCUIT VOLTAGE CHART....3-41
PRINTED CIRCUIT DIAGRAMS....3-45
1. MAIN P.C.BOARD....3-45
2. KEY P.C.BOARD....3-47
3. TIMER P.C.BOARD....3-47
4. SCART & 5.1CH P.C.BOARD(OPTIONAL PART)....3-49
5. POWER P.C.BOARD....3-49
6 KARAOKE P.C.BOARD (KARAOKE MODEL ONLY)....3-50

# ELECTRICAL TROUBLESHOOTING GUIDE

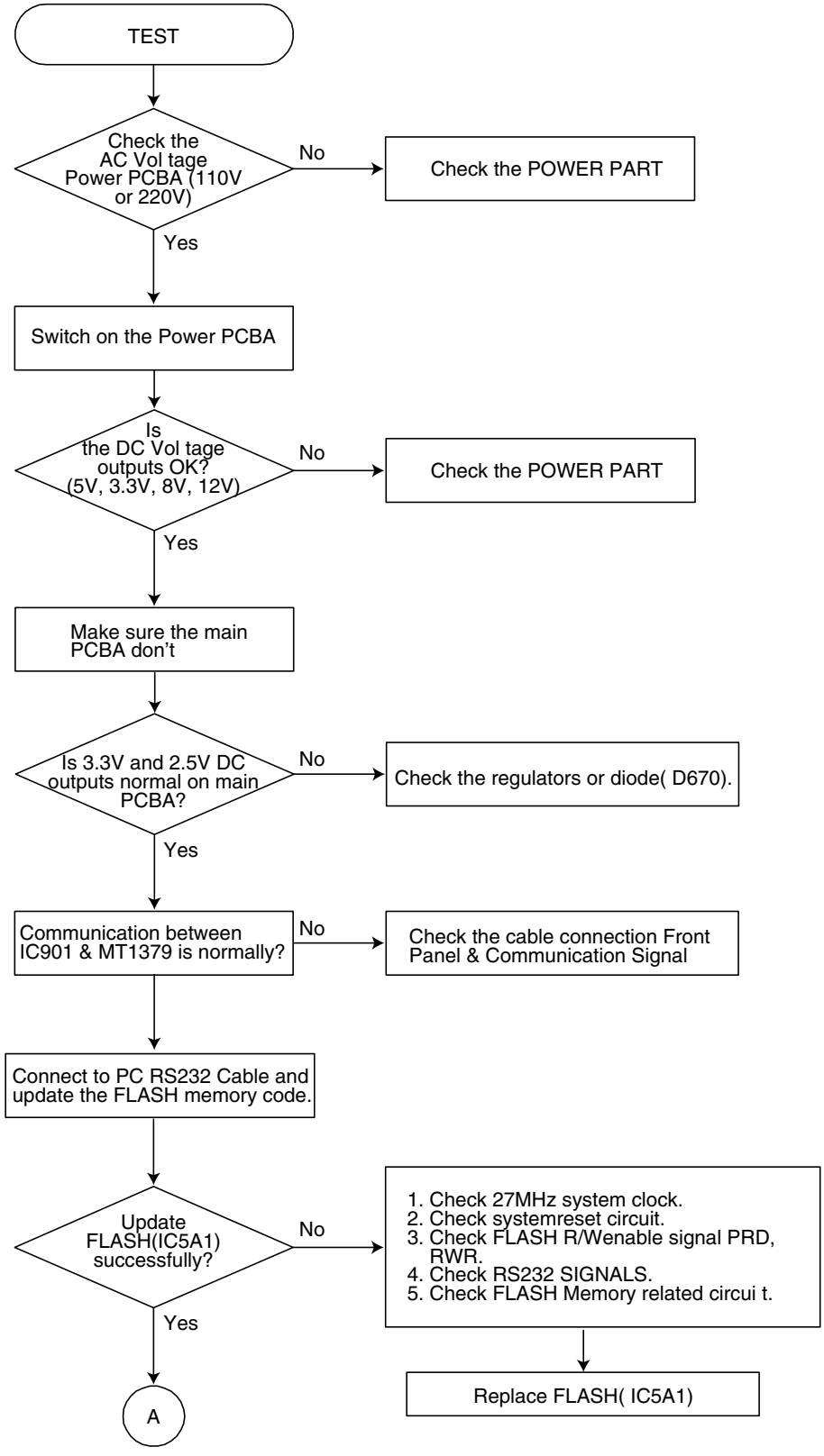
## 1. Power check flow

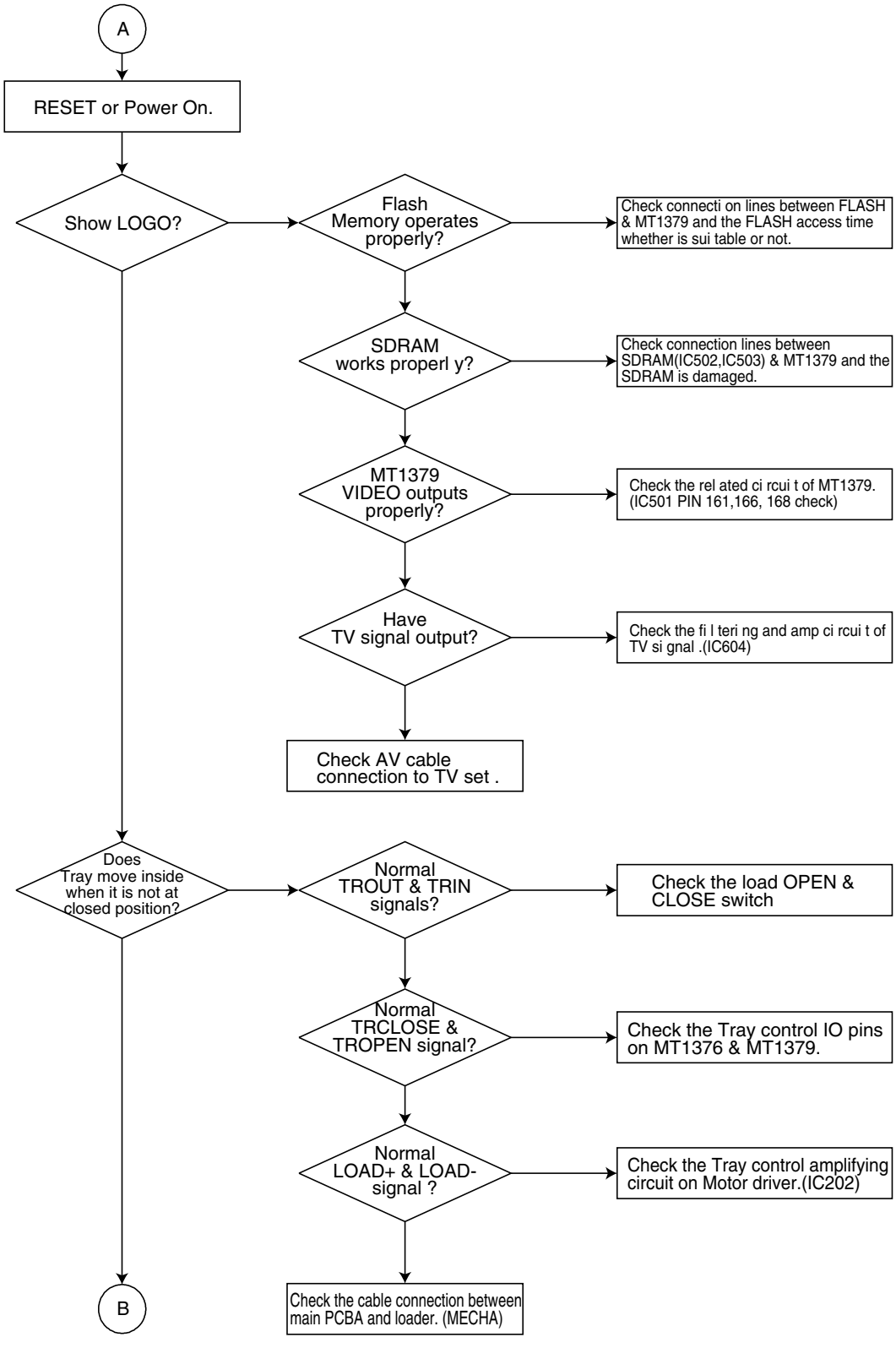


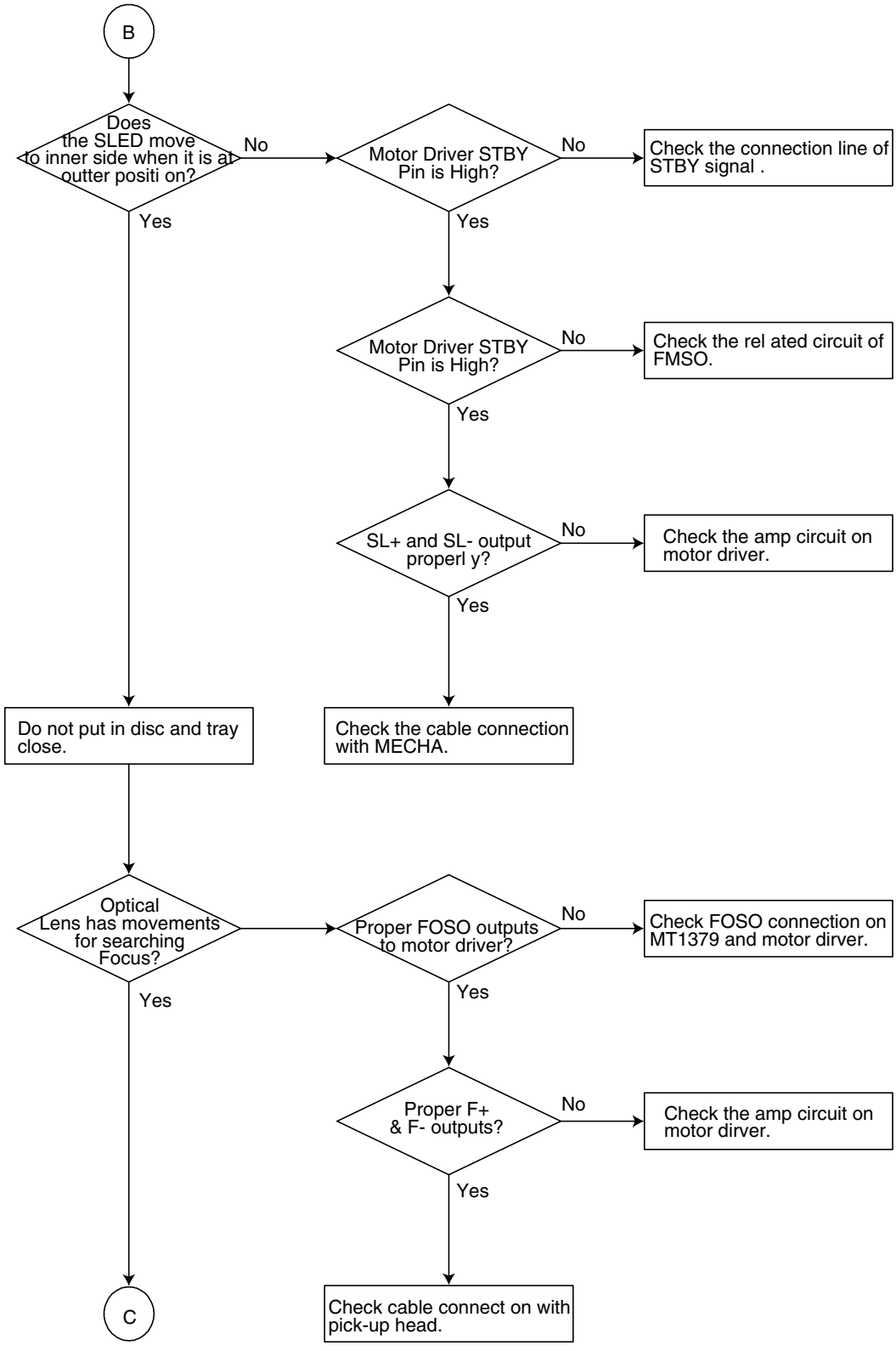
## 2. System operation flow

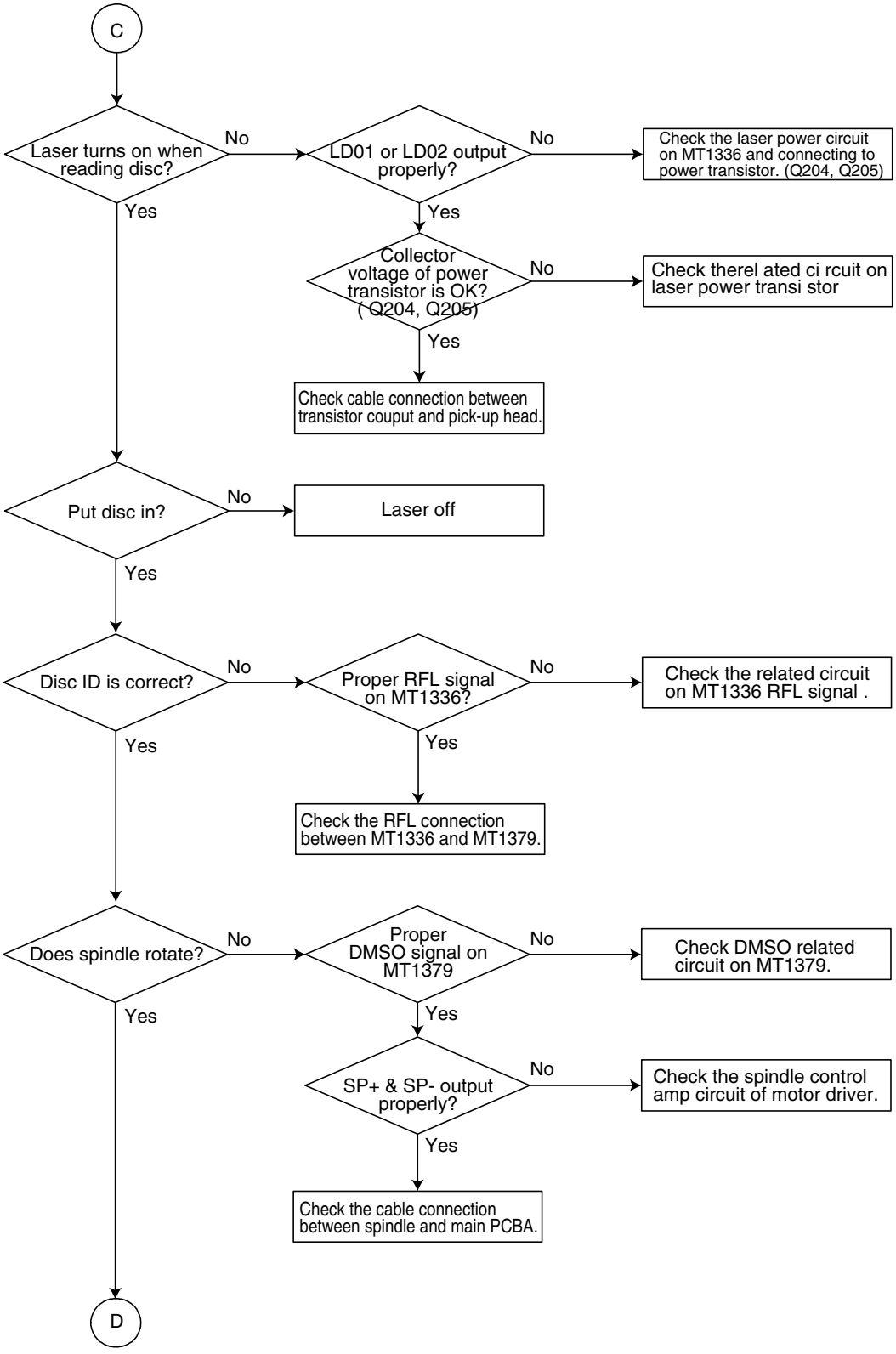


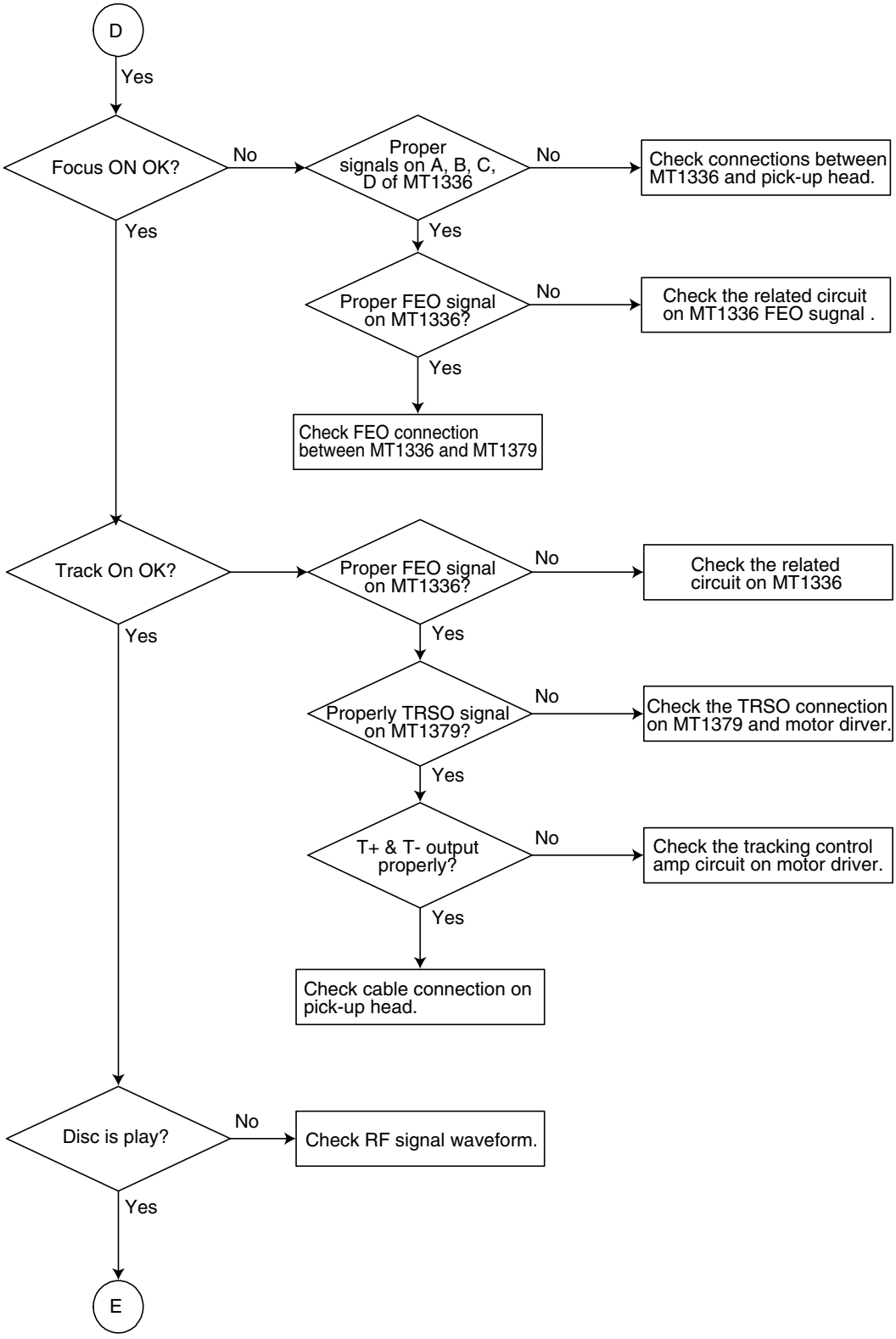
## 3. Test & debug flow

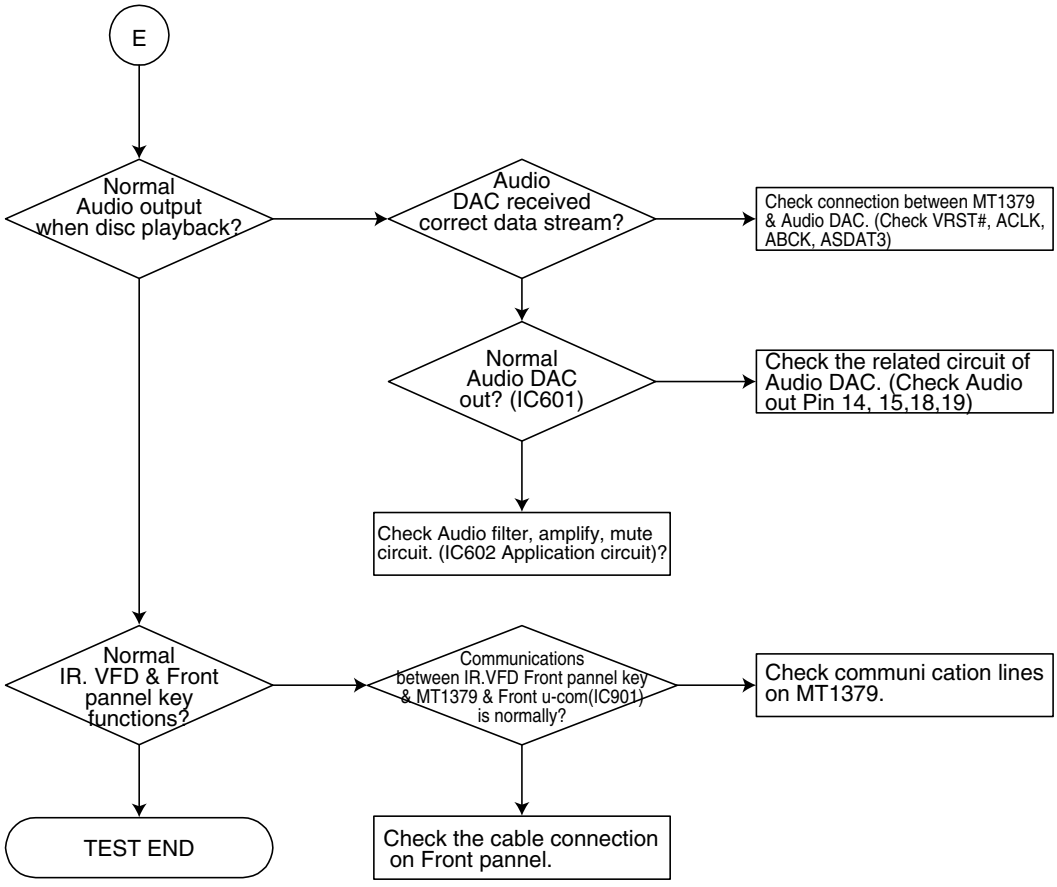

TEST
Check the AC Vol tage Power PCBA (110V or 220V)
No
Check the POWER PART
Yes
Switch on the Power PCBA
Is the DC Vol tage outputs OK? (5V, 3.3V, 8V, 12V)
No
Check the POWER PART
Yes
Make sure the main PCBA don't
Is 3.3V and 2.5V DC outputs normal on main PCBA?
No
Check the regulators or diode( D670).
Yes
Communication between IC901 & MT1379 is normally?
No
Check the cable connection Front Panel & Communication Signal
Connect to PC RS232 Cable and update the FLASH memory code.
Update FLASH(IC5A1) successfully?
No
1. Check 27MHz system clock.
2. Check systemreset circuit.
3. Check FLASH R/Wenable signal PRD, RWR.
4. Check RS232 SIGNALS.
5. Check FLASH Memory related circui t.
Replace FLASH( IC5A1)
Yes
A


A
RESET or Power On.
Show LOGO?
Flash Memory operates properly?
Check connecti on lines between FLASH & MT1379 and the FLASH access time whether is sui table or not.
SDRAM works properl y?
Check connection lines between SDRAM(IC502,IC503) & MT1379 and the SDRAM is damaged.
MT1379 VIDEO outputs properly?
Check the rel ated ci rcui t of MT1379. (IC501 PIN 161,166, 168 check)
Have TV signal output?
Check the fi l teri ng and amp ci rcui t of TV si gnal .(IC604)
Check AV cable connection to TV set .
Does Tray move inside when it is not at closed position?
Normal TROUT & TRIN signals?
Check the load OPEN & CLOSE switch
Normal TRCLOSE & TROPEN signal?
Check the Tray control IO pins on MT1376 & MT1379.
Normal LOAD+ & LOAD- signal ?
Check the Tray control amplifying circuit on Motor driver.(IC202)
Check the cable connection between main PCBA and loader. (MECHA)
B

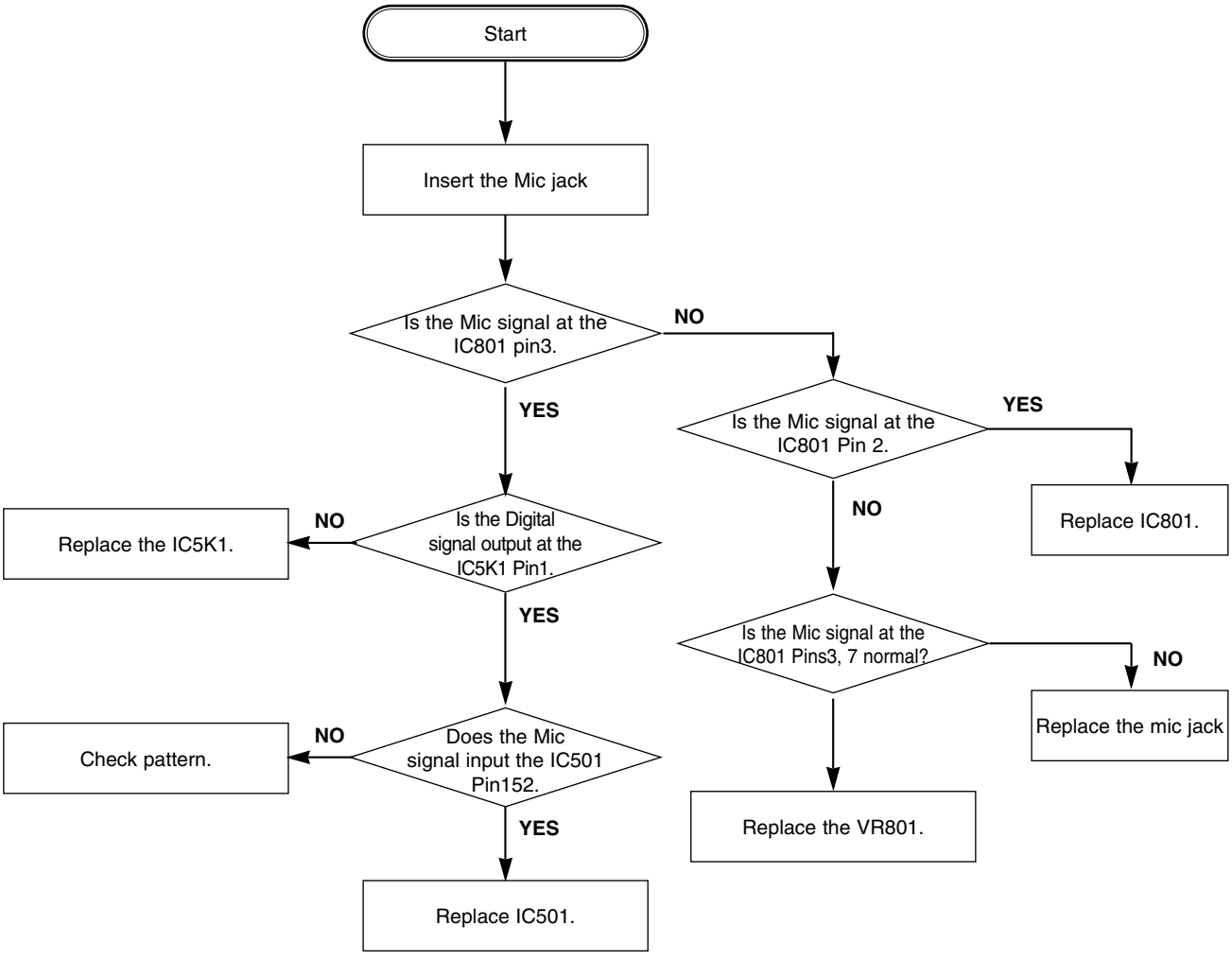

B
Does the SLED move to inner side when it is at outter positi on?
No
Yes
Motor Driver STBY Pin is High?
No
Check the connection line of STBY signal .
Yes
Motor Driver STBY Pin is High?
No
Check the rel ated circuit of FMSO.
Yes
SL+ and SL- output properl y?
No
Check the amp circuit on motor driver.
Yes
Do not put in disc and tray close.
Check the cable connection with MECHA.
Optical Lens has movements for searching Focus?
Proper FOSO outputs to motor driver?
No
Check FOSO connection on MT1379 and motor dirver.
Yes
Yes
Proper F+ & F- outputs?
No
Check the amp circuit on motor dirver.
Yes
C
Check cable connect on with pick-up head.


C
Laser turns on when reading disc?
No
LD01 or LD02 output properly?
No
Check the laser power circuit on MT1336 and connecting to power transistor. (Q204, Q205)
Yes
Yes
Collector voltage of power transistor is OK? ( Q204, Q205)
No
Check therel ated ci rcuit on laser power transi stor
Yes
Check cable connection between transistor couput and pick-up head.
Put disc in?
No
Laser off
Yes
Disc ID is correct?
No
Proper RFL signal on MT1336?
No
Check the related circuit on MT1336 RFL signal .
Yes
Yes
Check the RFL connection between MT1336 and MT1379.
Does spindle rotate?
No
Proper DMSO signal on MT1379
No
Check DMSO related circuit on MT1379.
Yes
Yes
SP+ & SP- output properly?
No
Check the spindle control amp circuit of motor driver.
Yes
Check the cable connection between spindle and main PCBA.
D


D
Yes
Focus ON OK?
No
Proper signals on A, B, C, D of MT1336
No
Check connections between MT1336 and pick-up head.
Yes
Yes
Proper FEO signal on MT1336?
No
Check the related circuit on MT1336 FEO sugnal .
Yes
Check FEO connection between MT1336 and MT1379
Track On OK?
Proper FEO signal on MT1336?
No
Check the related circuit on MT1336
Yes
Yes
Properly TRSO signal on MT1379?
No
Check the TRSO connection on MT1379 and motor dirver.
Yes
T+ & T- output properly?
No
Check the tracking control amp circuit on motor driver.
Yes
Check cable connection on pick-up head.
Disc is play?
No
Check RF signal waveform.
Yes
E


E
Normal Audio output when disc playback?
Audio DAC received correct data stream?
Check connection between MT1379 & Audio DAC. (Check VRST#, ACLK, ABCK, ASDAT3)
Normal Audio DAC out? (IC601)
Check the related circuit of Audio DAC. (Check Audio out Pin 14, 15,18,19)
Check Audio filter, amplify, mute circuit. (IC602 Application circuit)?
Normal IR. VFD & Front pannel key functions?
Communications between IR.VFD Front pannel key & MT1379 & Front u-com(IC901) is normally?
Check communi cation lines on MT1379.
TEST END
Check the cable connection on Front pannel.

## 4. KARAOKE Flow (KARAOKE MODEL ONLY)



# DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

## 1. SYSTEM 27MHz CLOCK,RESET,FLASH R/W SIGNAL

### 1) MT1379 main clock is at 27MHz(X501)

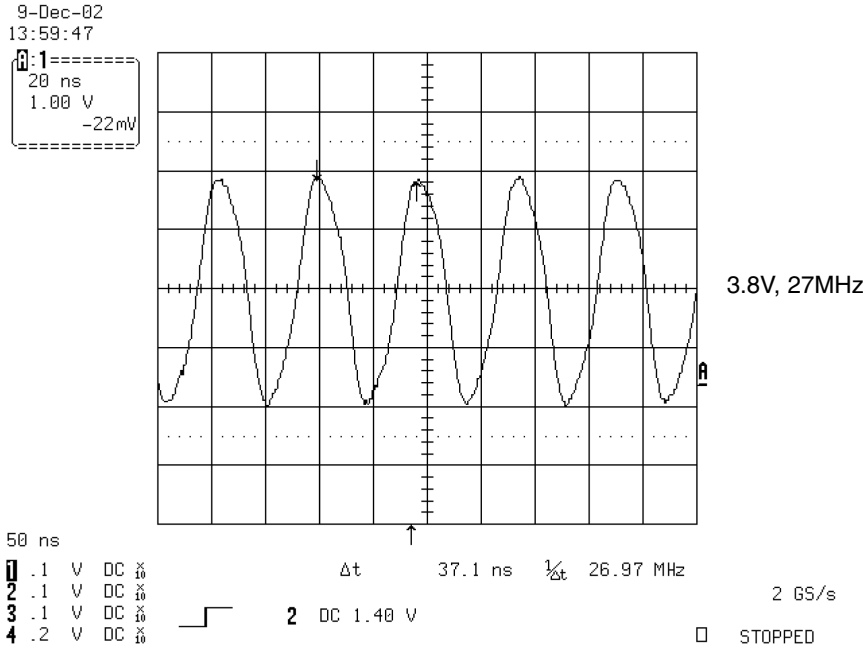



**FIG 1-1**

### 2) MT1379 & MT1336 reset is high active.

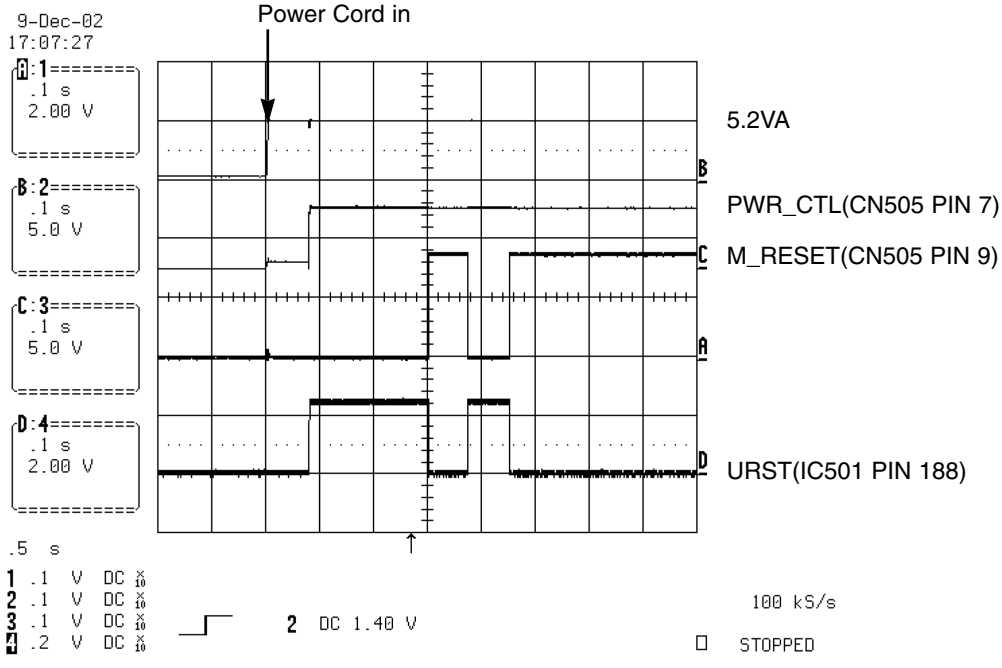



**FIG 1-2**

## 3) RS232 waveform during procedure(Downloading)

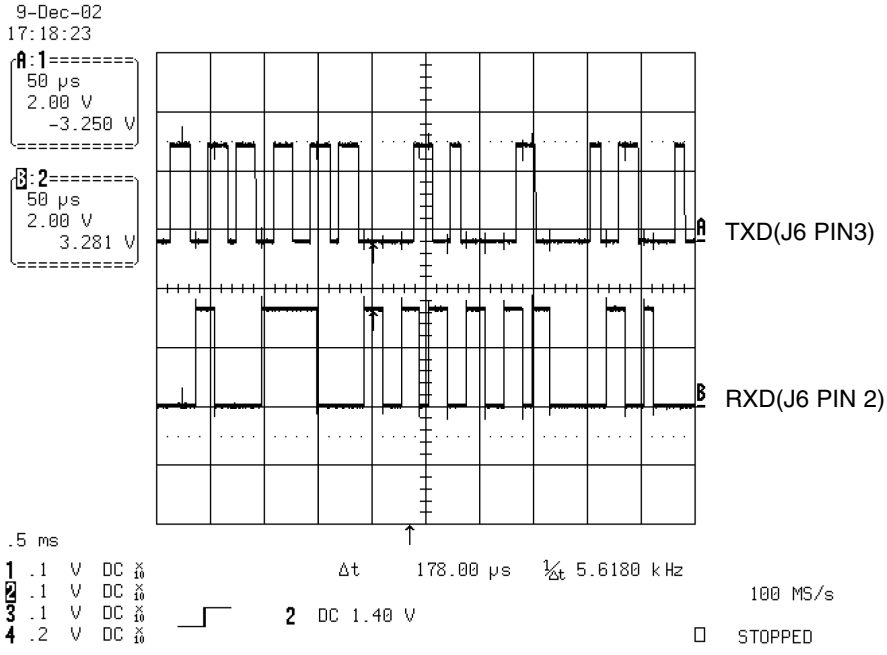



**FIG 1-3**

## 4) Flash R/W enable signal during download(Downloading)

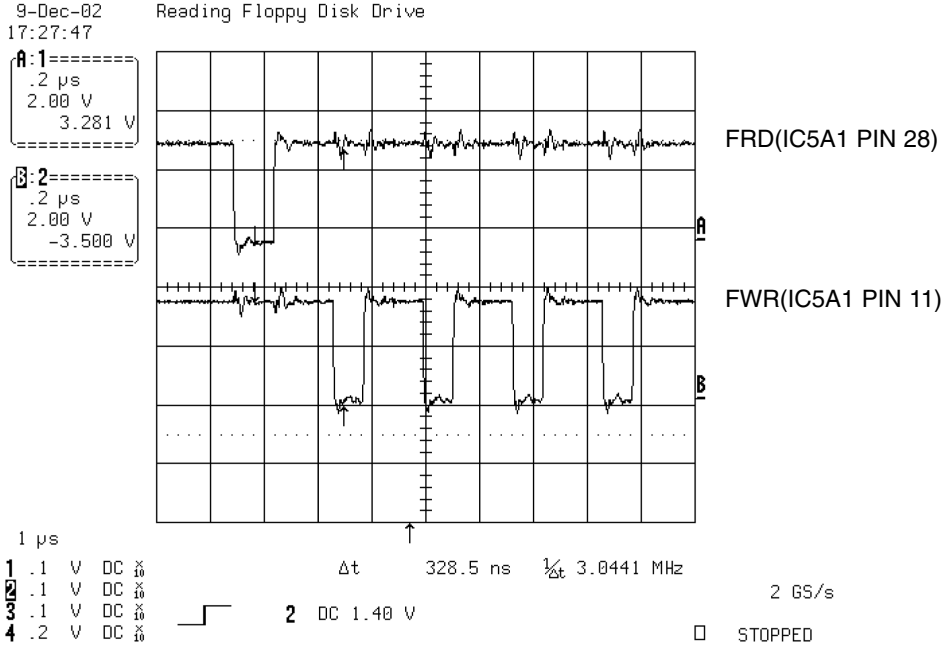



**FIG 1-4**

## 2. SDRAM CLOCK

### 1) MT1379 main clock is at 27MHz(X501)

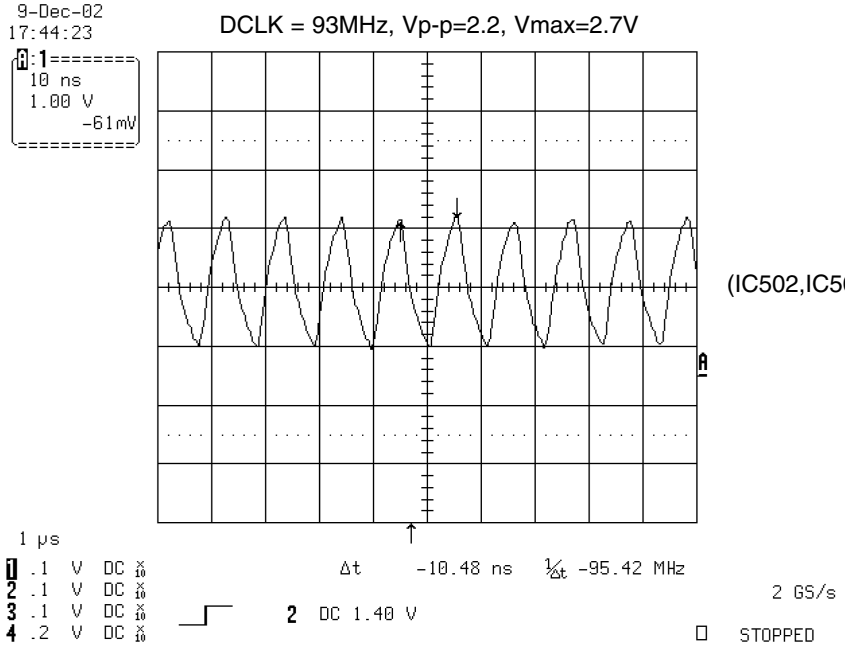



**FIG 2-1**

## 3. TRAY OPEN/CLOSE SIGNAL

### 1) Tray open/close waveform

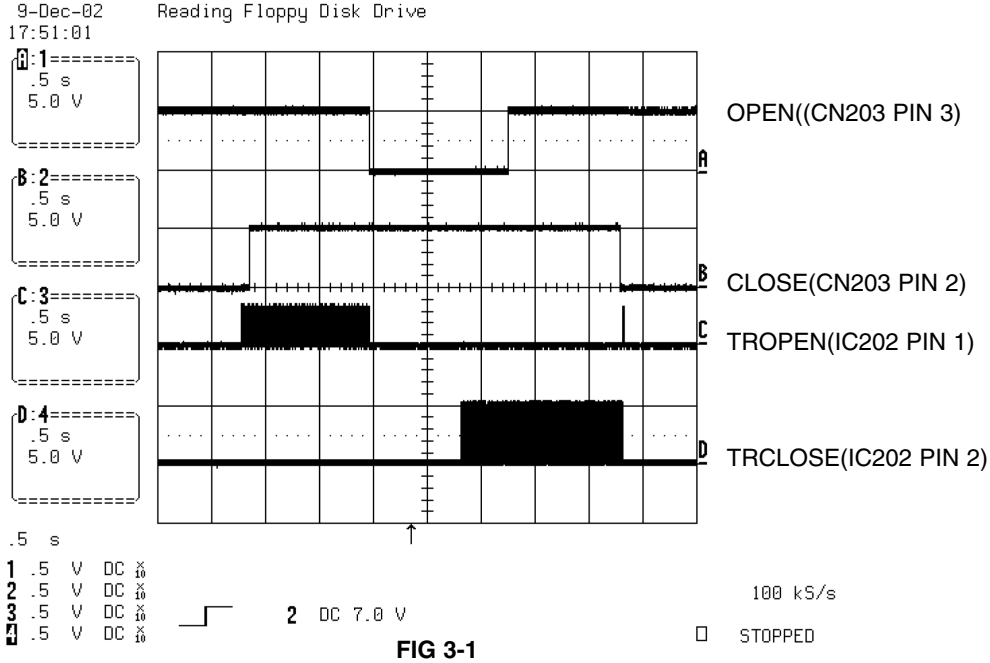



**FIG 3-1**

## 2) Tray close waveform

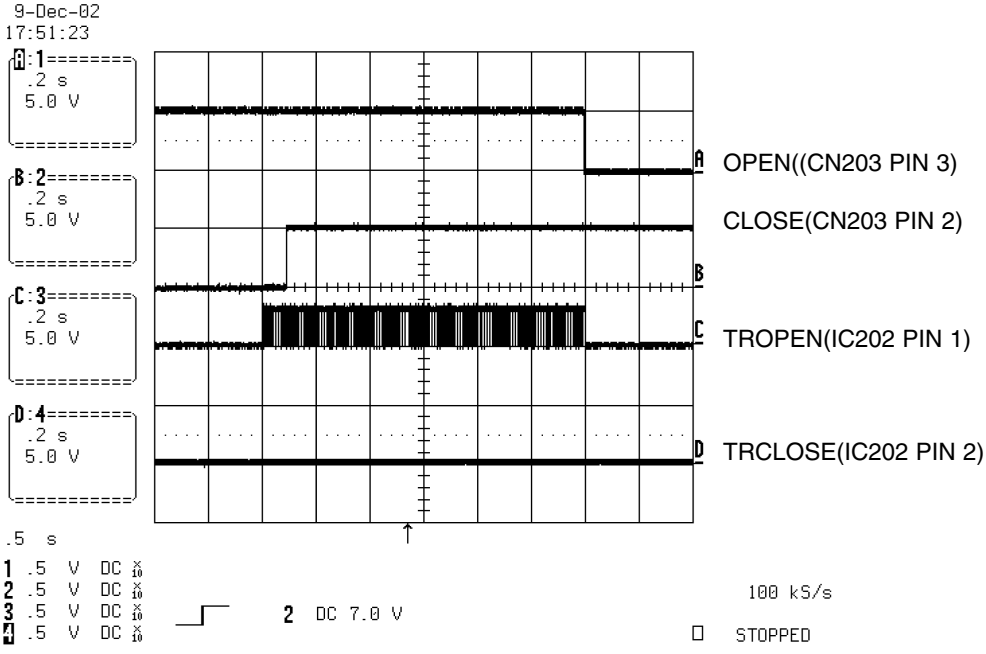



**FIG 3-2**

## 3) Tray open waveform

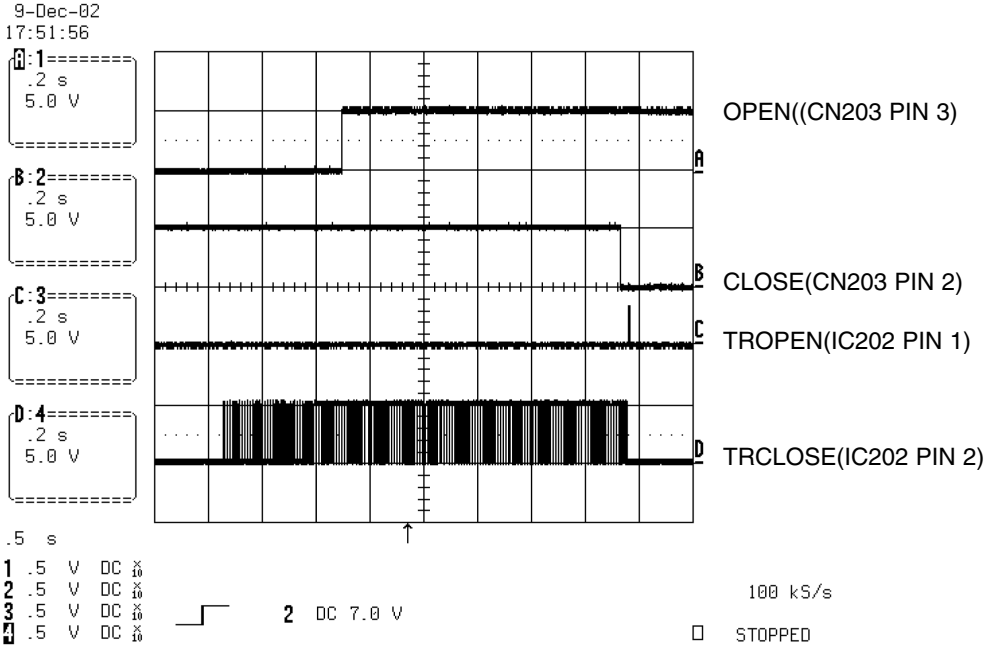
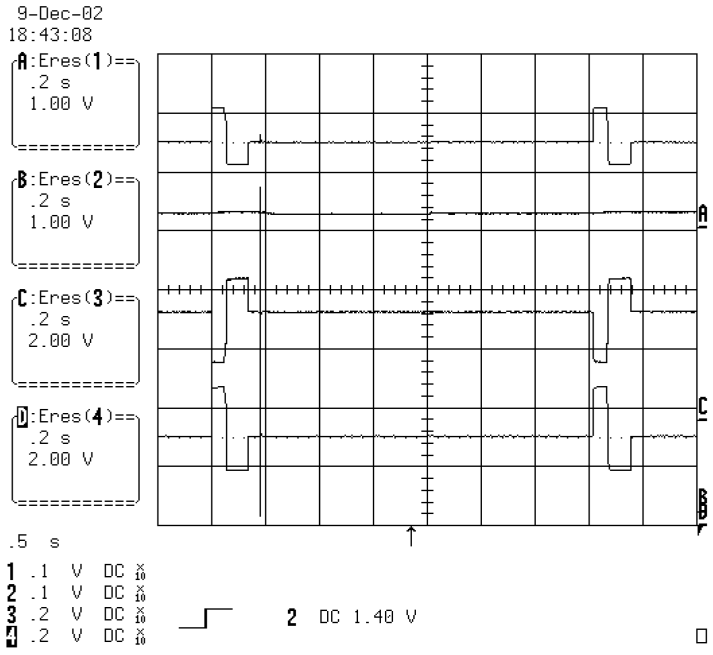



**FIG 3-3**

## 4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)




FMSO(2.0V/1.4V/1.0V)
(IC501 PIN 19)

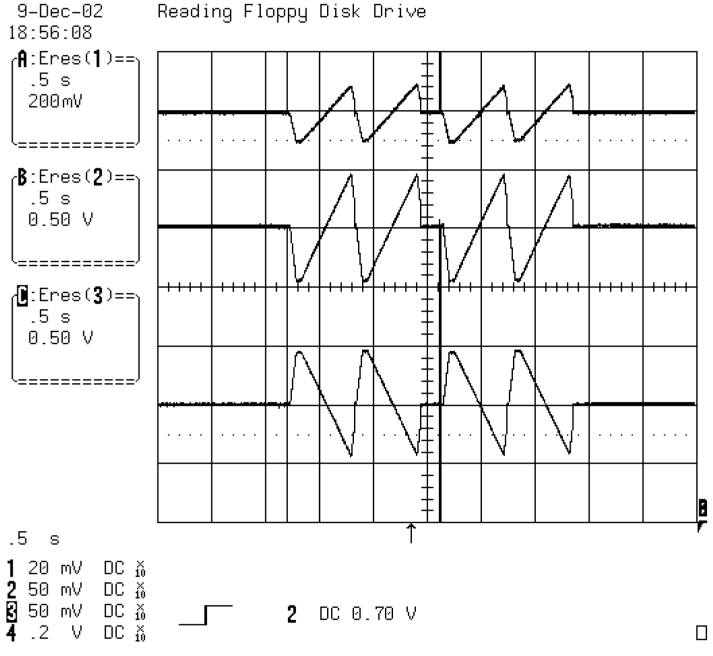
STBY(5V) – (IC201 PIN 50)

SL+(4.7V/3.6V/1.9V)
(IC202 PIN 12)

SL-(5.3V/3.7V/2.5V)
(IC202 PIN 13)

**FIG 4-1**

## 5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)




FOSO(1.5V/1.4V/1.3V)
(IC501 PIN 12)

F+(4.0V/3.6V/3.2V)
(IC202 PIN 9)

F-(4.0V/3.6V/3.2V)
(IC202 PIN 8)

**FIG 5-1**

## 6. LASER POWER CONTROL RELATED SIGNAL(NO DISC CONDITION)

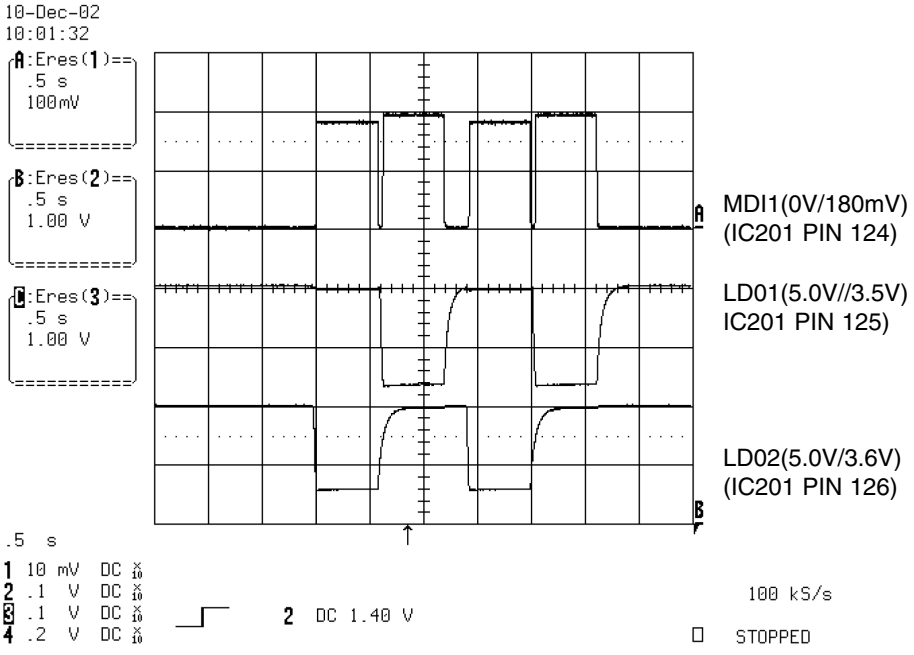



**FIG 6-1**

## 7. DISC TYPE JUDGEMENT WAVEFORM

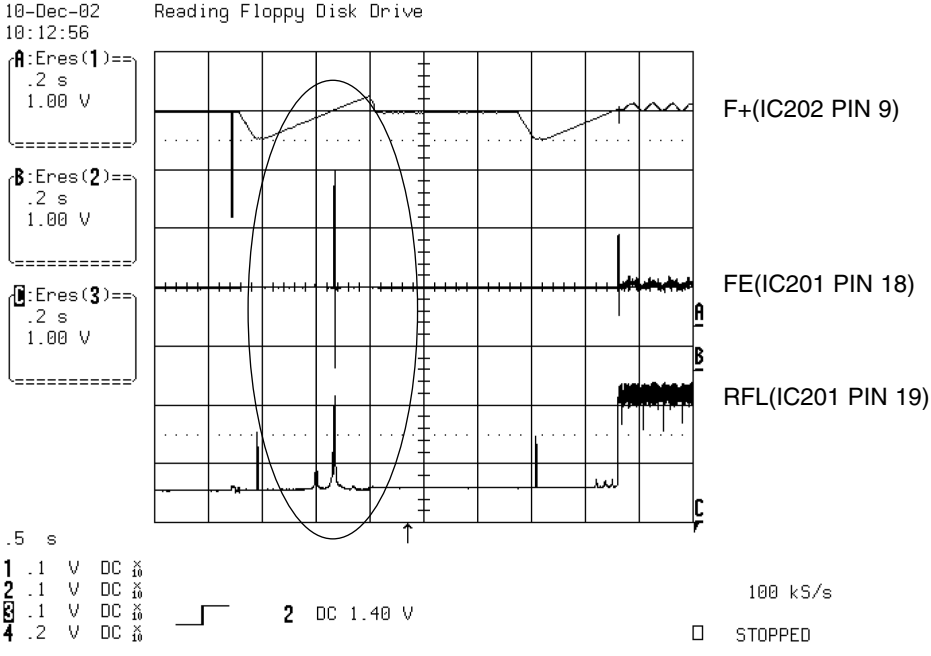



**FIG 7-1 (DVD)**

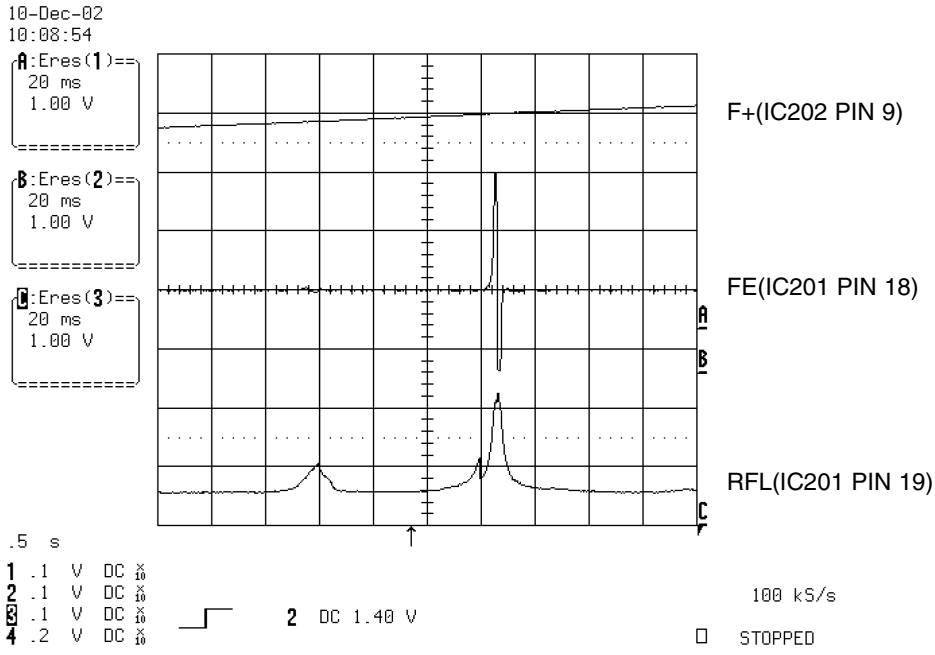



**FIG 7-2 (DVD)**

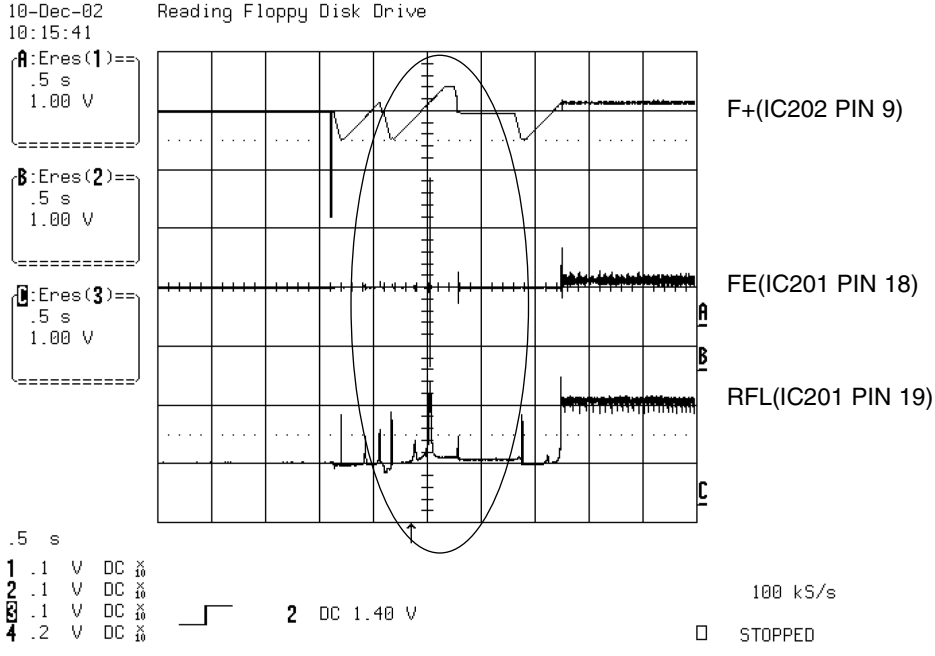



**FIG 7-3 (CD)**

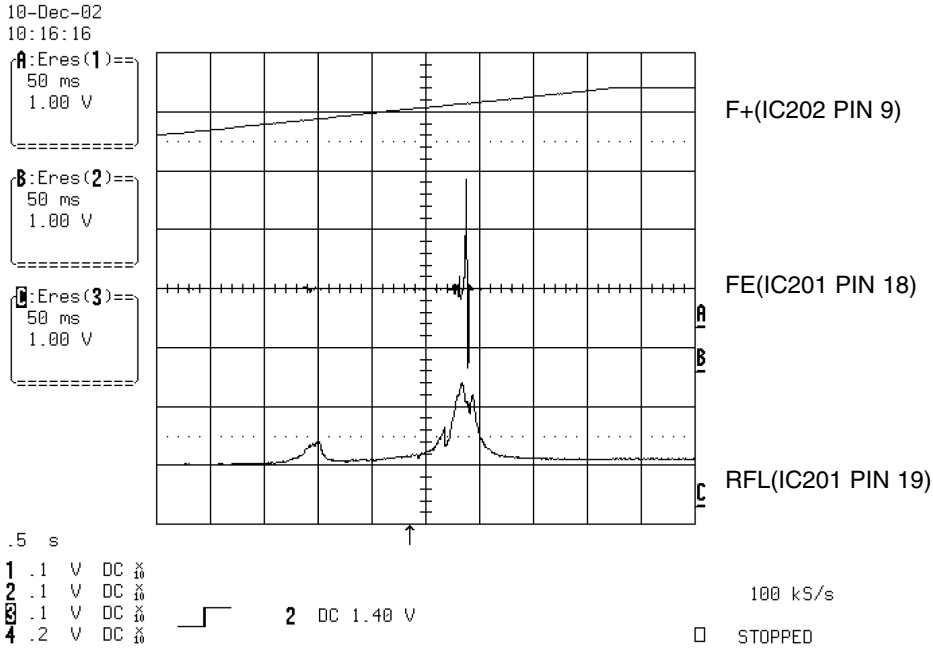



**FIG 7-4 (CD)**

## 8. FOCUS ON WAVEFORM

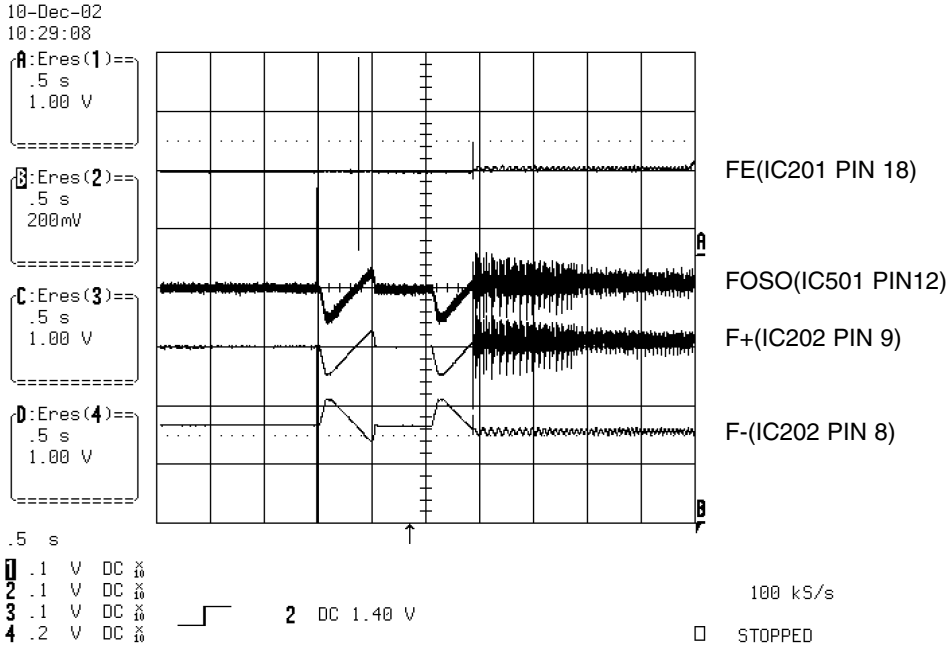



**FIG 8-1 (DVD)**

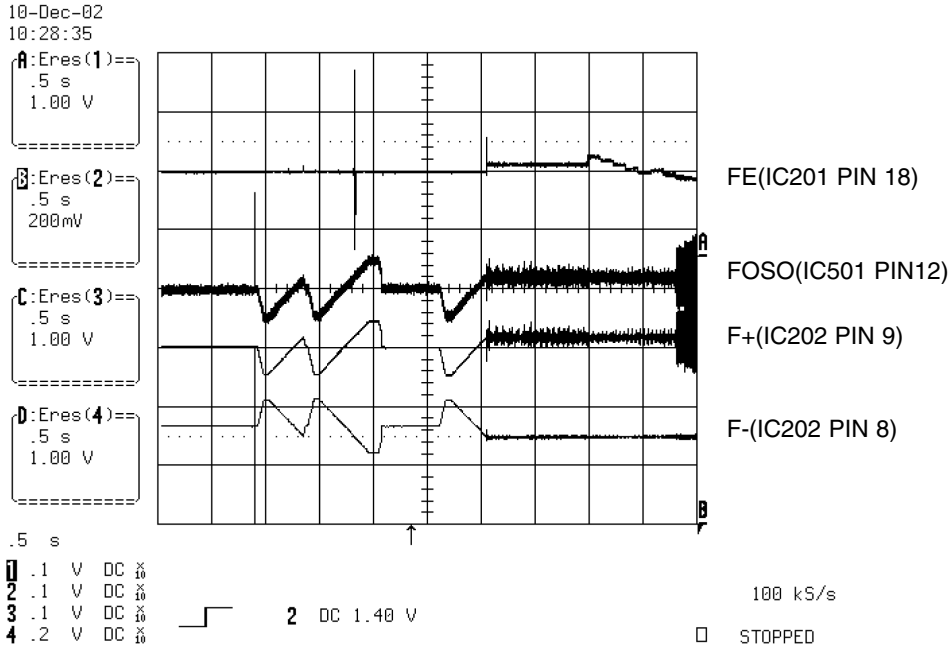



**FIG 8-2 (CD)**

## 9. SPINDLE CONTROL WAVEFORM (NO DISC CONDITION)

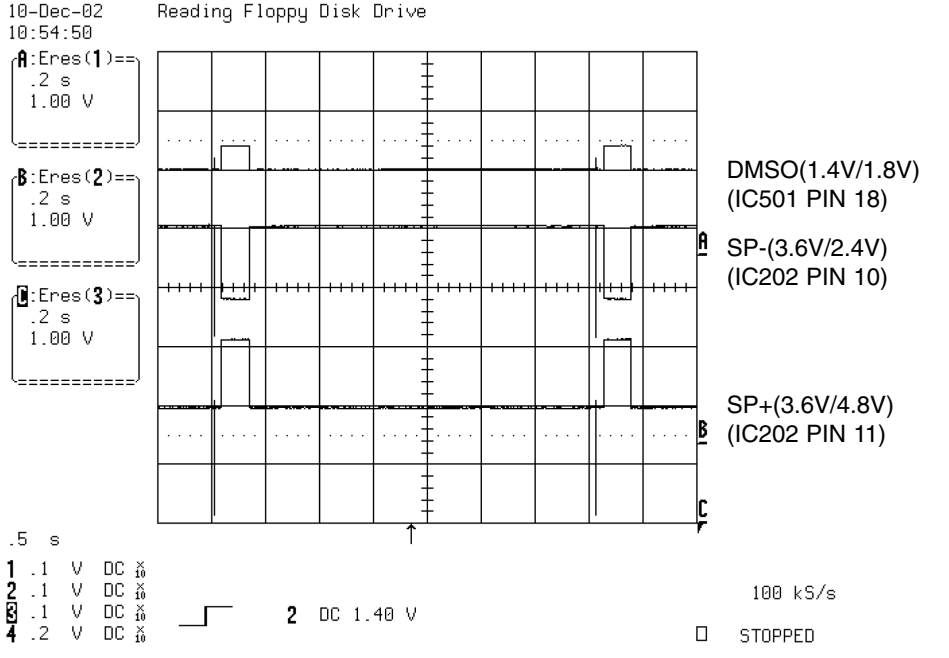



**FIG 9-1**

## 10. TRACKING CONTROL RELATED SIGNAL(System checking)

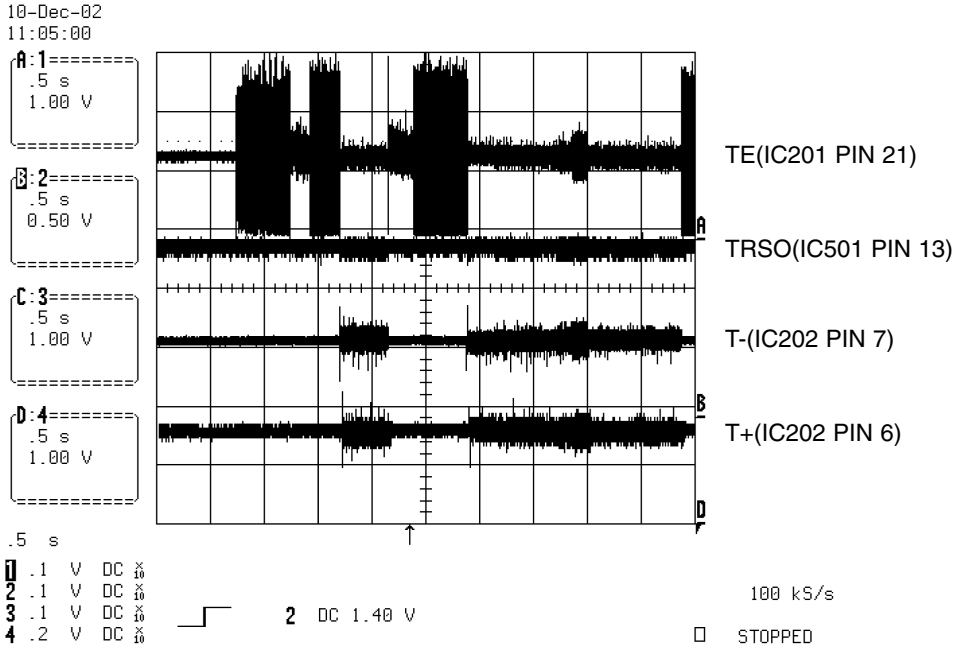



**FIG 10-1(DVD)**

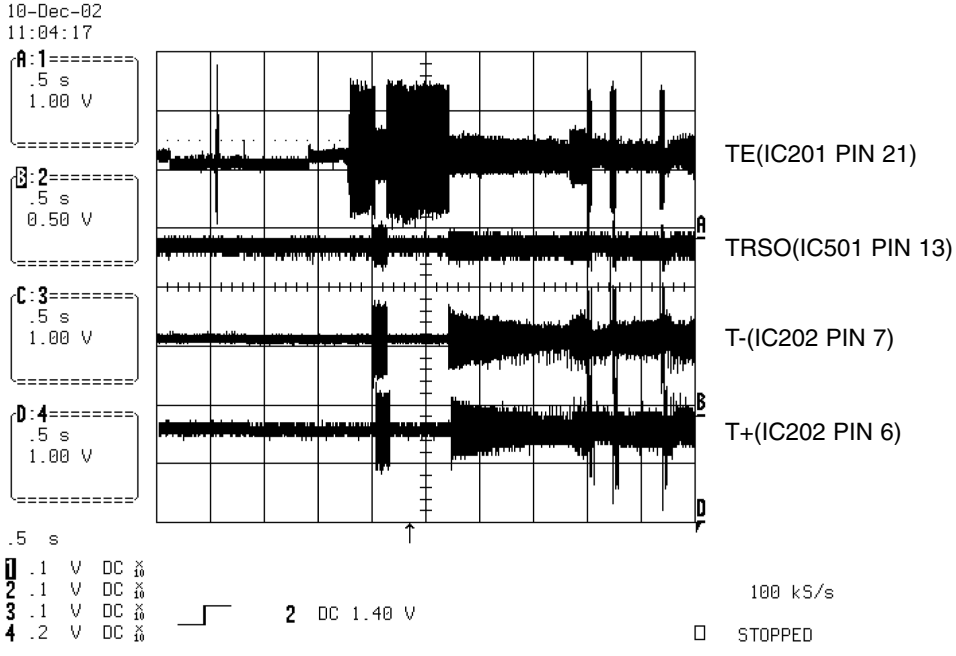



**FIG 10-2(CD)**

## 11. RF WAVEFORM

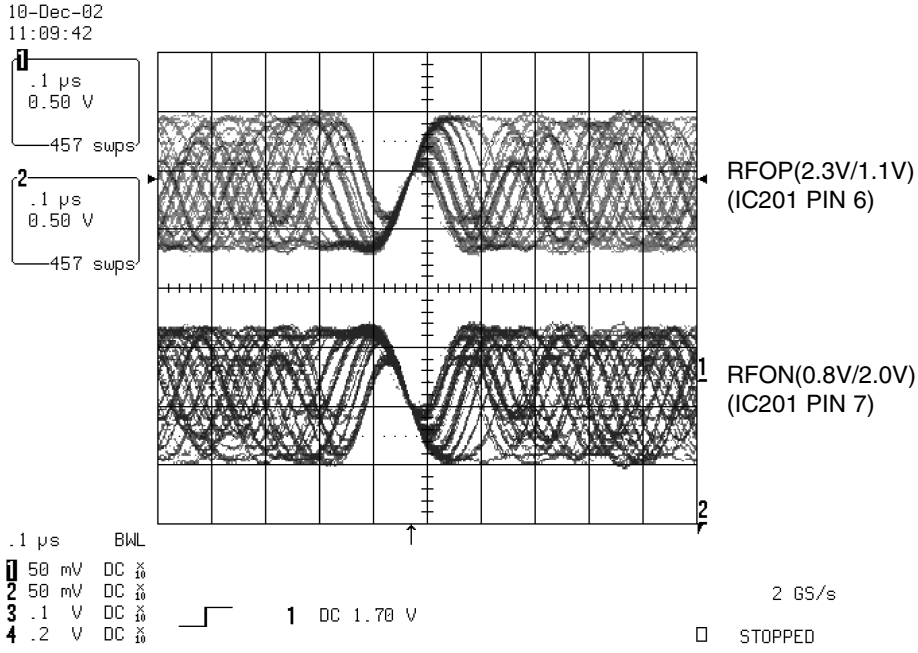



**FIG 11-1**

## 12. MT1379 AUDIO OPTICAL AND COAXIAL OUTPUT (ASPDIF)

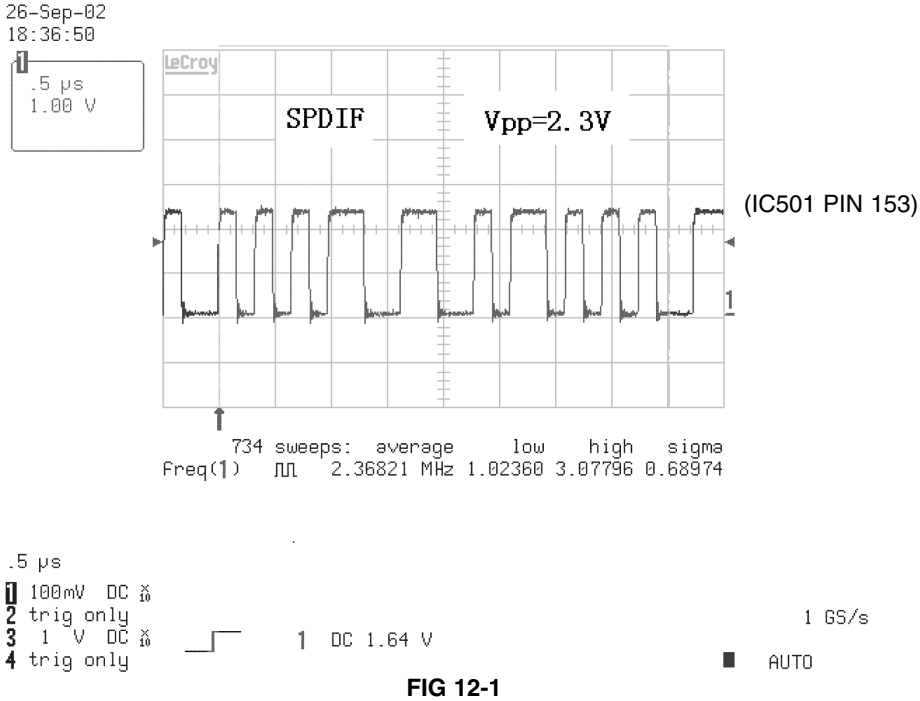
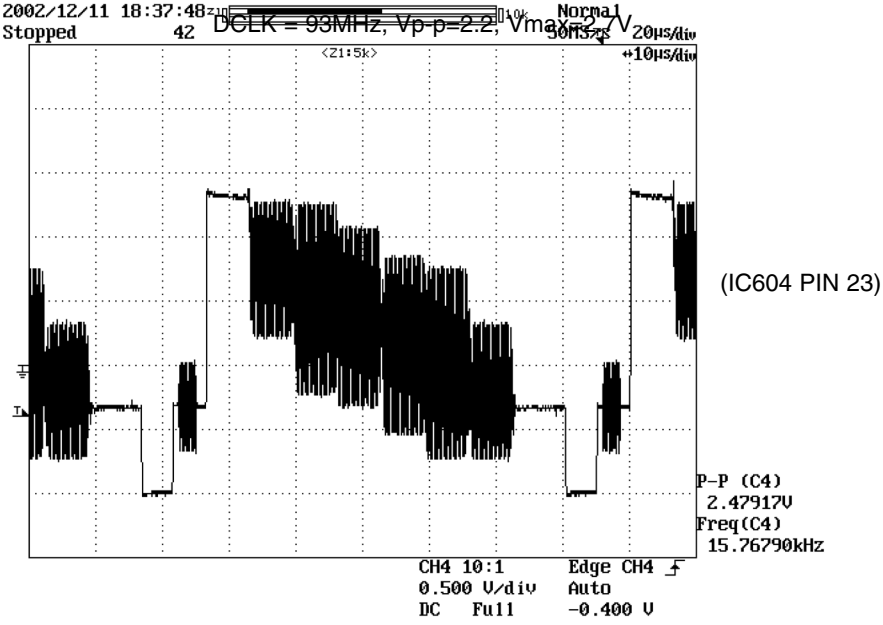



**FIG 12-1**

## 13. MT1379 VIDEO OUTPUT WAVEFORM

### 1) Full colorbar signal(CVBS)

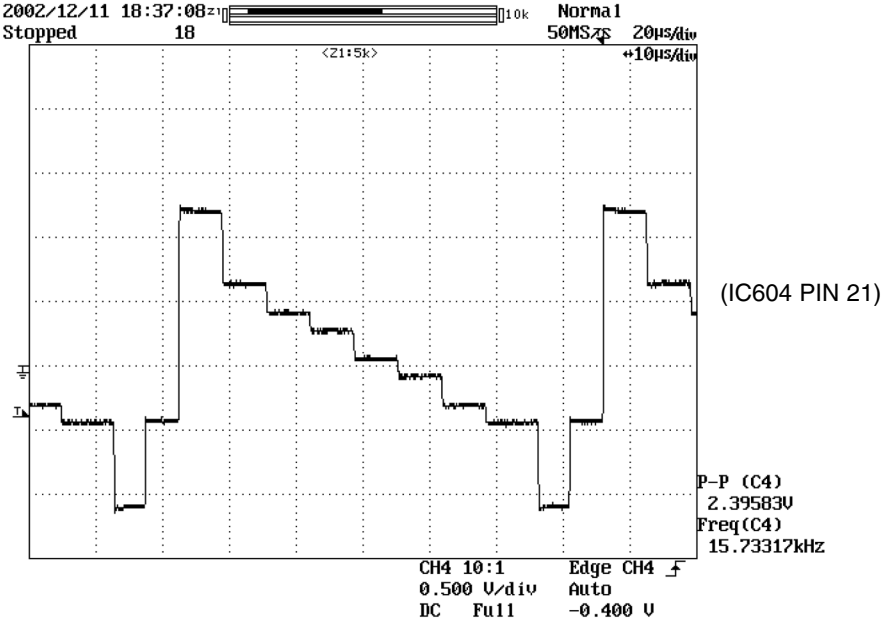



DCLK = 93MHz, Vp-p=2.2, Vmax=2.7V

(IC604 PIN 23)

**FIG 13-1**

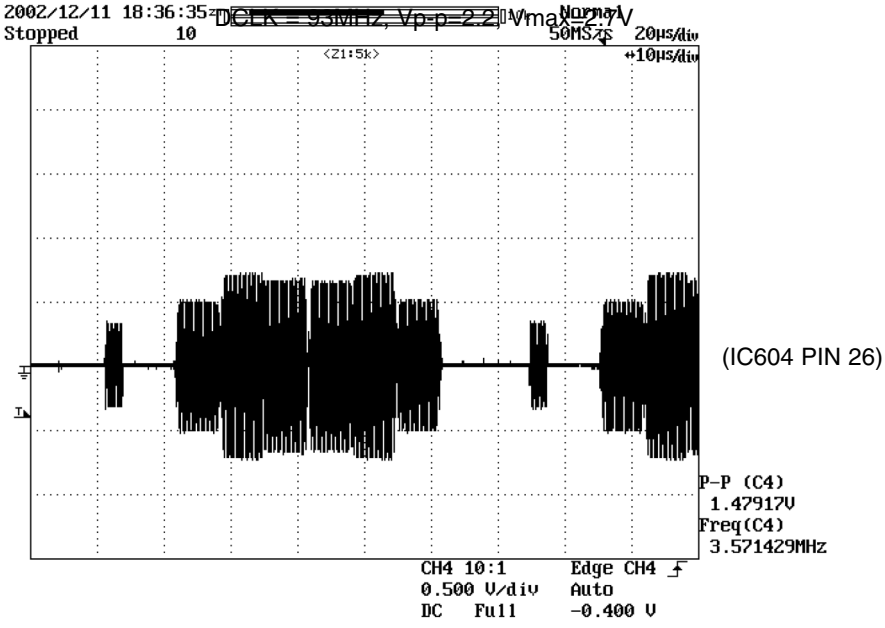
### 2) Y




(IC604 PIN 21)

**FIG 13-2**

### 3) C

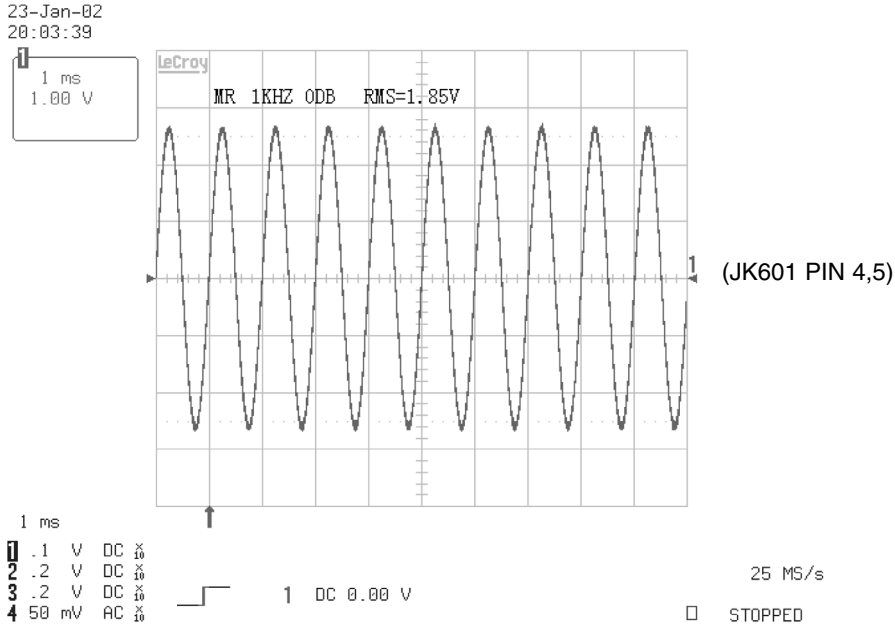



(IC604 PIN 26)

**FIG 13-3**

## 14. AUDIO OUTPUT FROM AUDIO DAC

### 1) Audio L/R




(JK601 PIN 4,5)

**FIG 14-1**

## 2) Audio related Signal

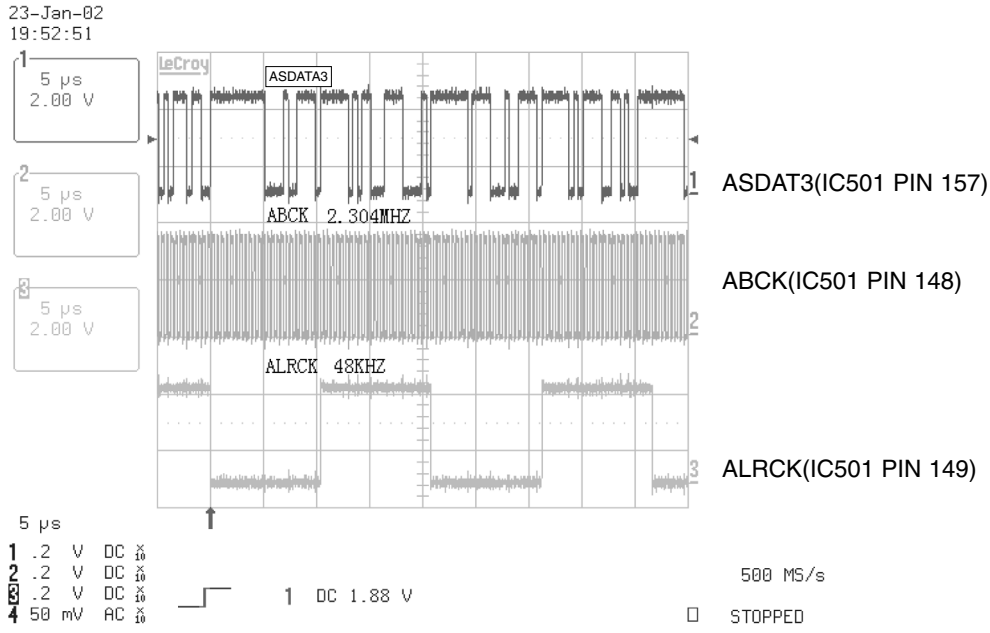
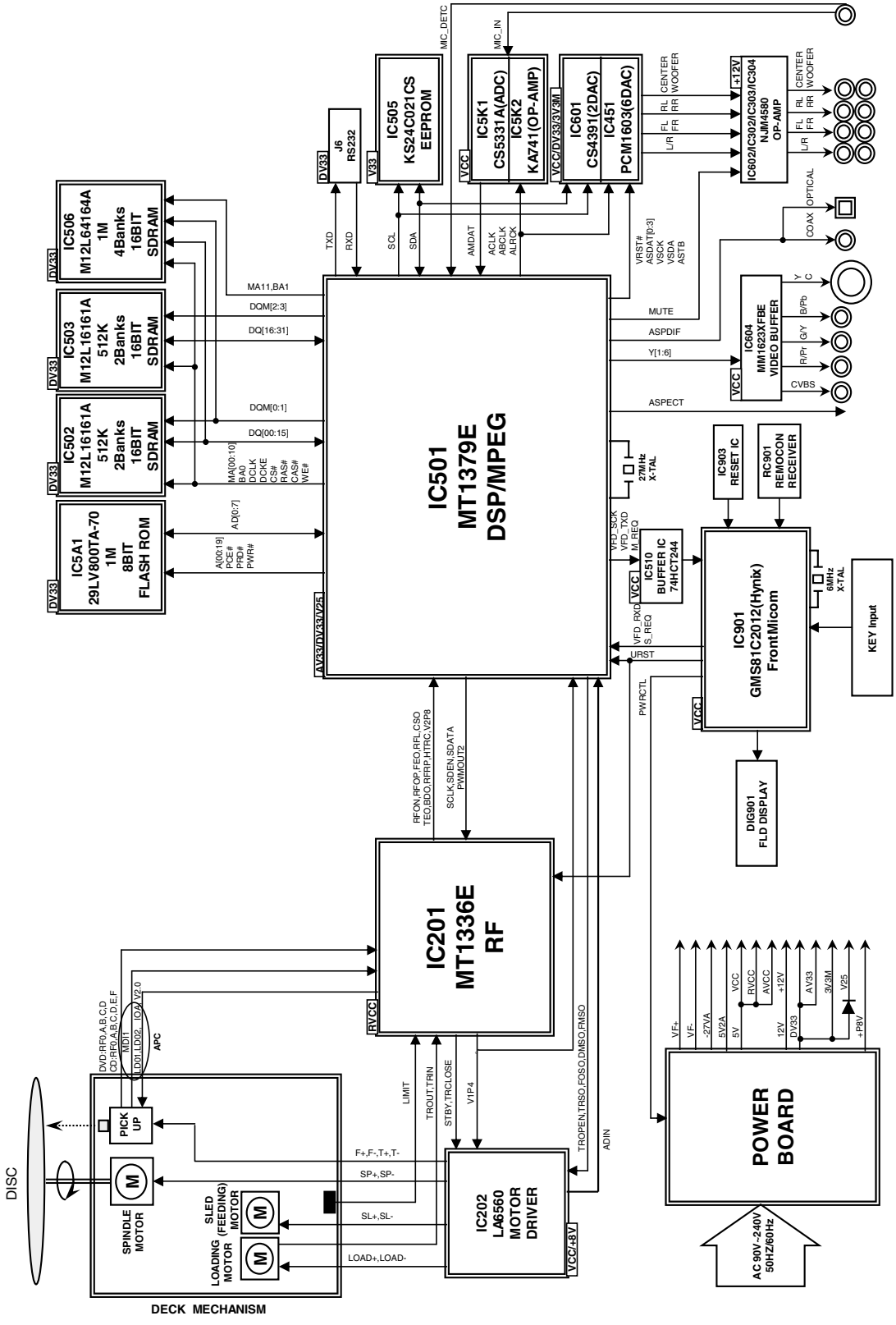



**FIG 14-2**

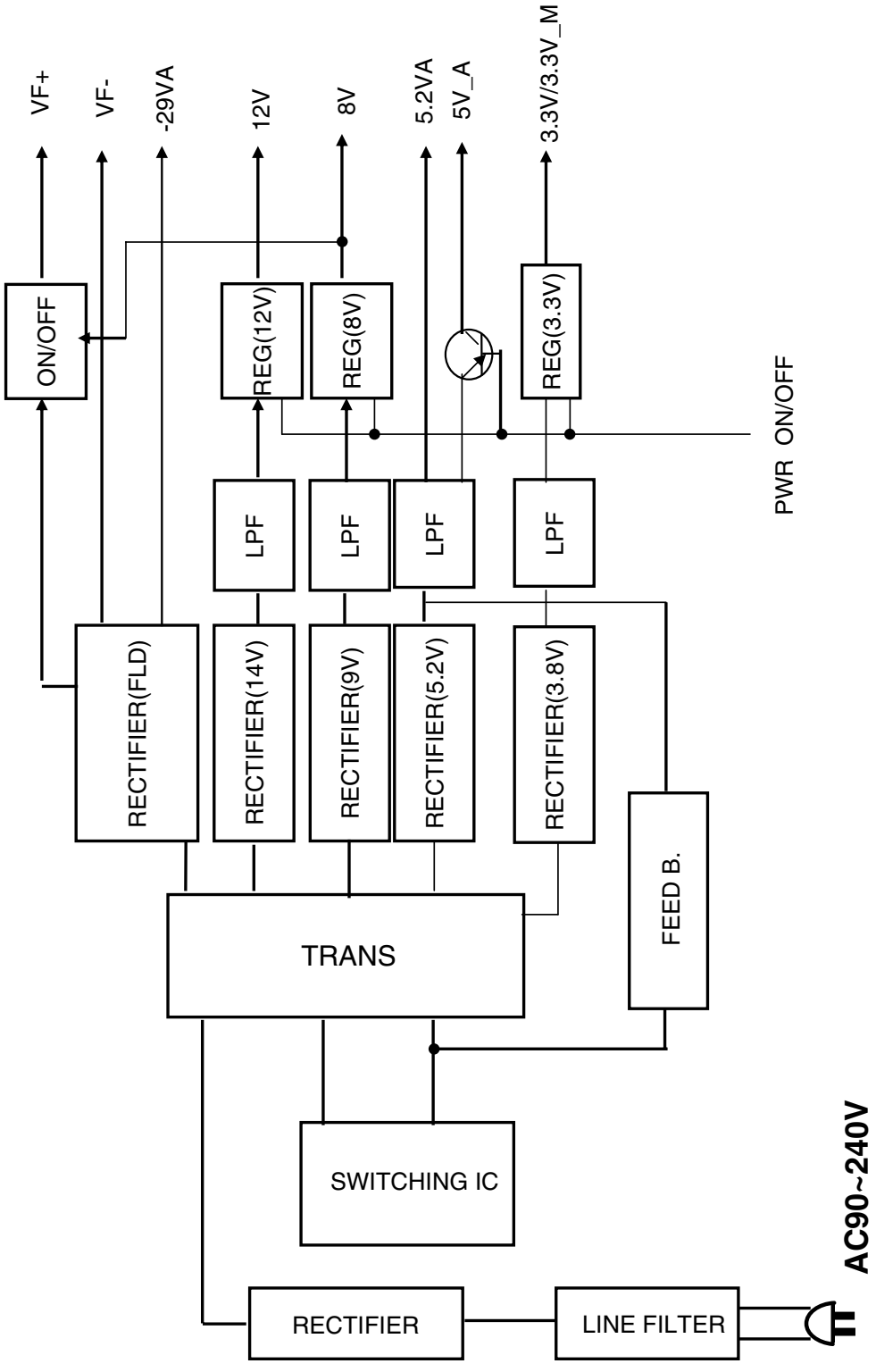
# BLOCK DIAGRAMS

## 1. Overall Block Diagram



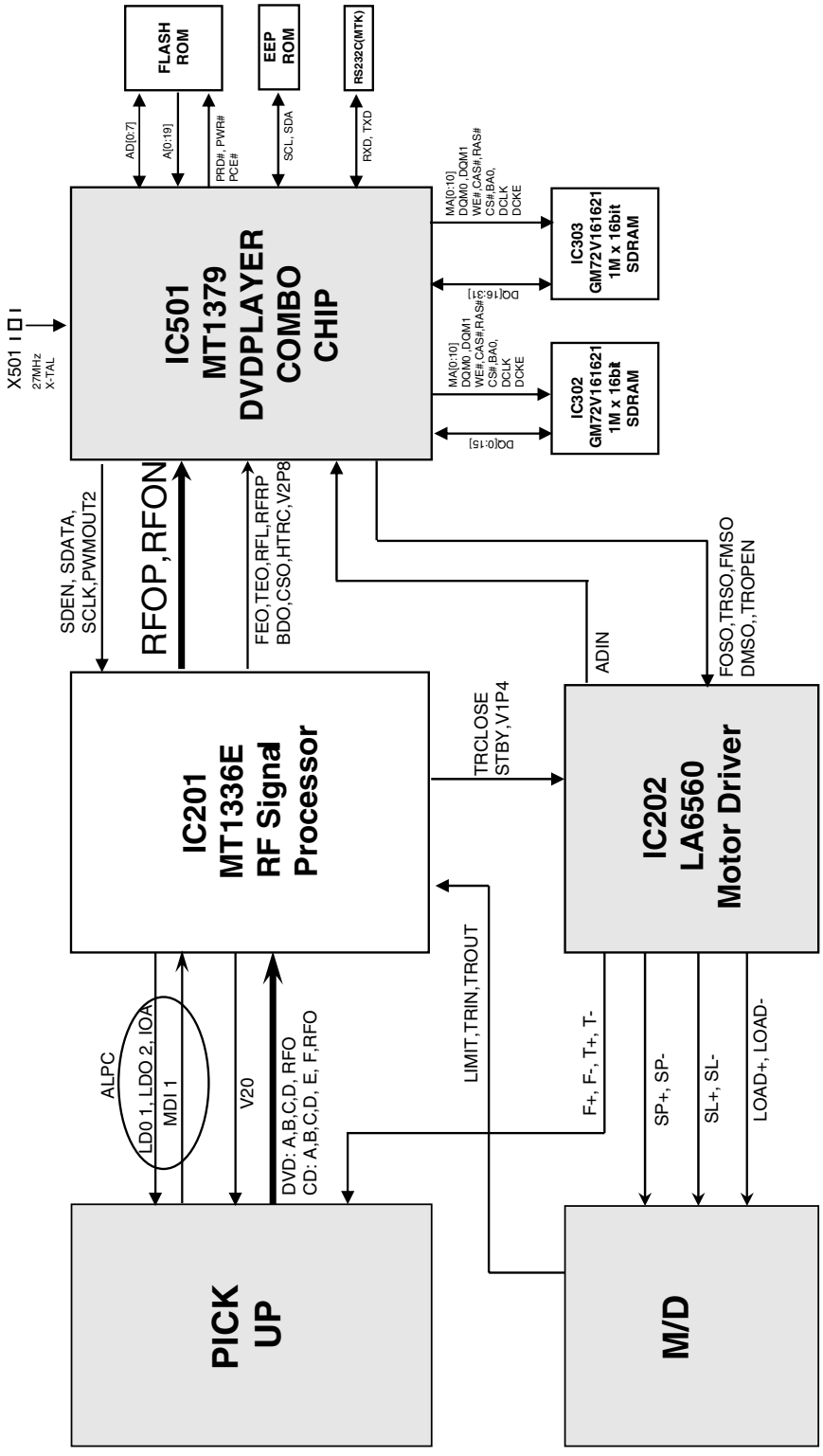

DV7800M'S

## 2. Power(SMPS) Block Diagram



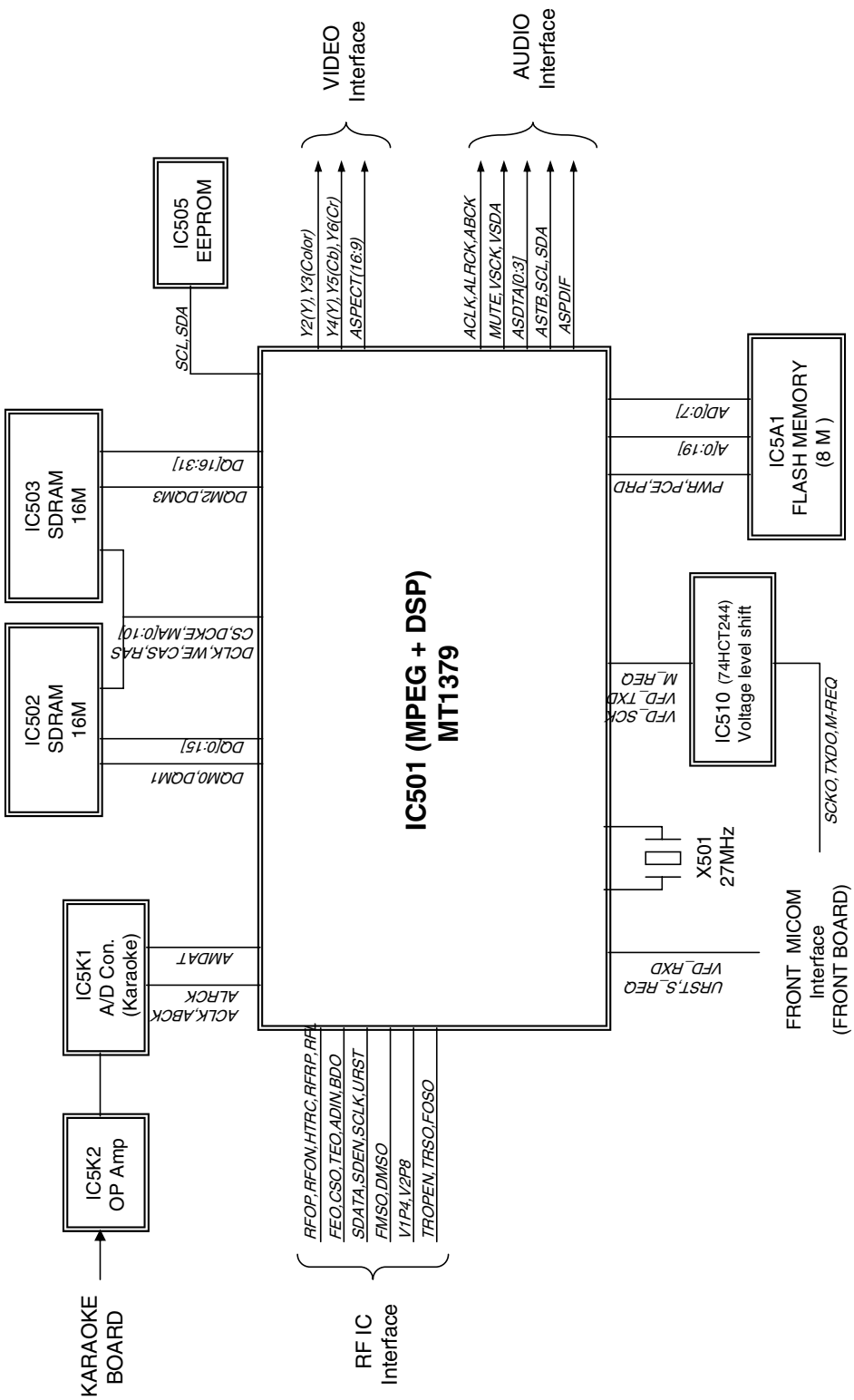

DV7800M'S

## 3. SERVO Block Diagram



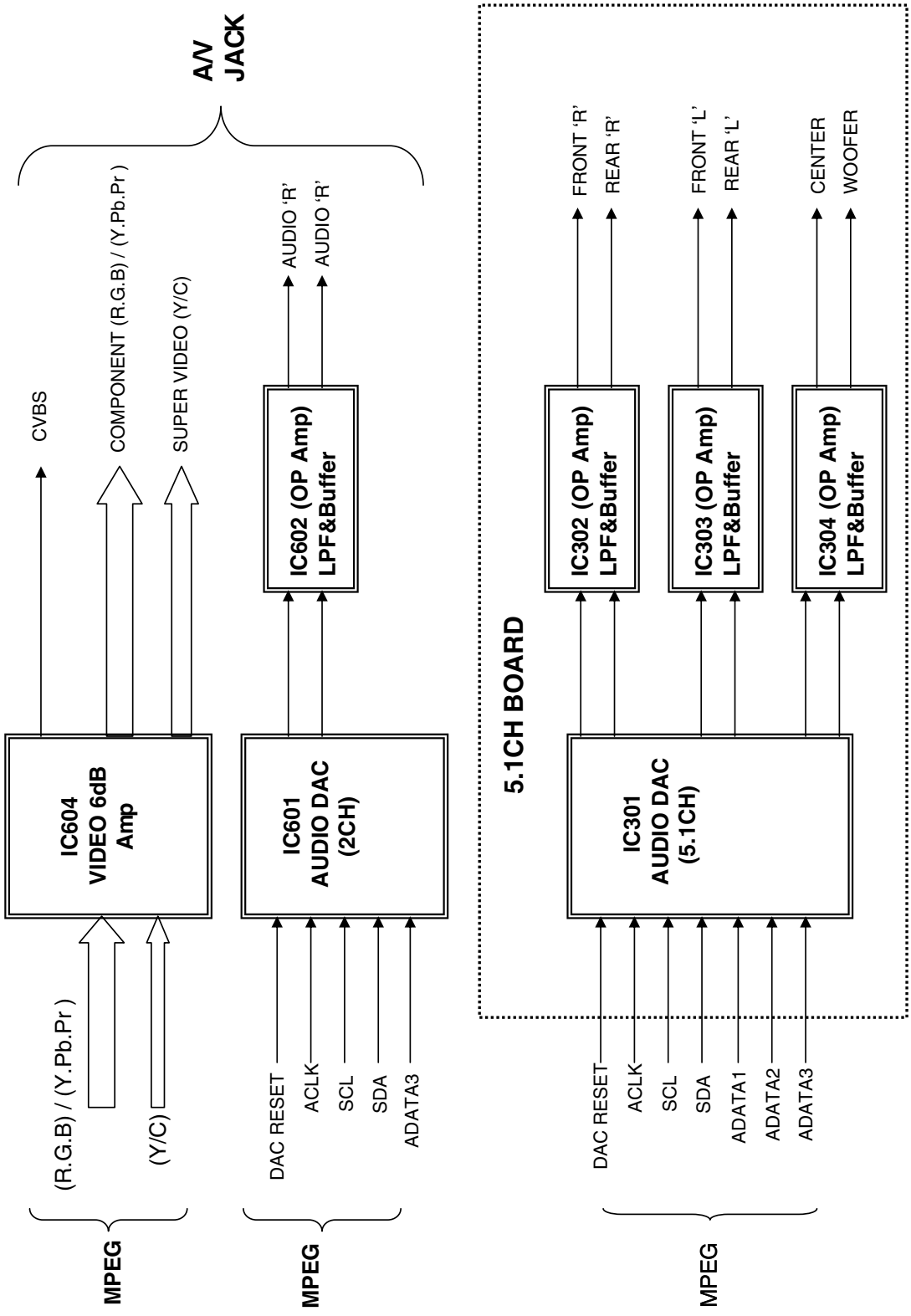

DV7800M'S

# 4. MPEG & MEMORY Block Diagram



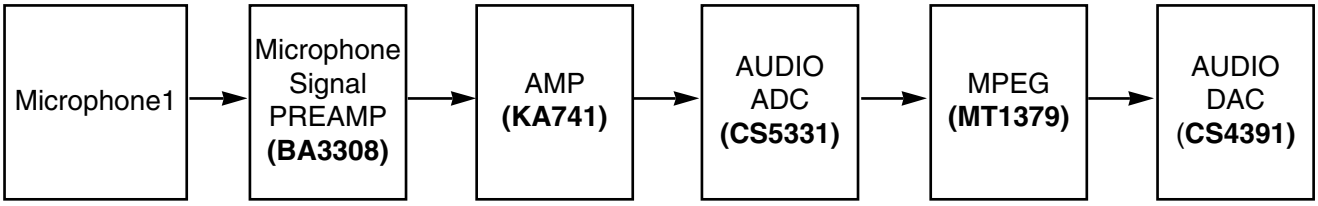

DV7800M'S

## 5. VIDEO & AUDIO Block Diagram




DV7800M'S

## 6. KARAOKE Block Diagram(KARAOKE MODEL ONLY)




**(Block Digram)**

1 The unit turns to KARAOKE MODE with ou-screen lyrics display and melody sound when it play backs VCD or DVD KARAOKE DISC.

2. IF a microphone is connected at this time, MICON recoguizes the connection and prepares the composition of external voice and internal melody.

3. The week signal of the microphone is converted to the digital signal after voice output that has passed through PREAMP(BA3308) and AMP(KA741) passes through(CS5331) that is Audio ADC(Analog to Digital convertor).

4. This digital signal enters NT1379 that is MPEG IC

5. This mixed signal is output to AV JACK after passing through AUDIO DAC(CS4391).

# CIRCUIT DIAGRAMS

## 1. POWER(SMPS) CIRCUIT DIAGRAM

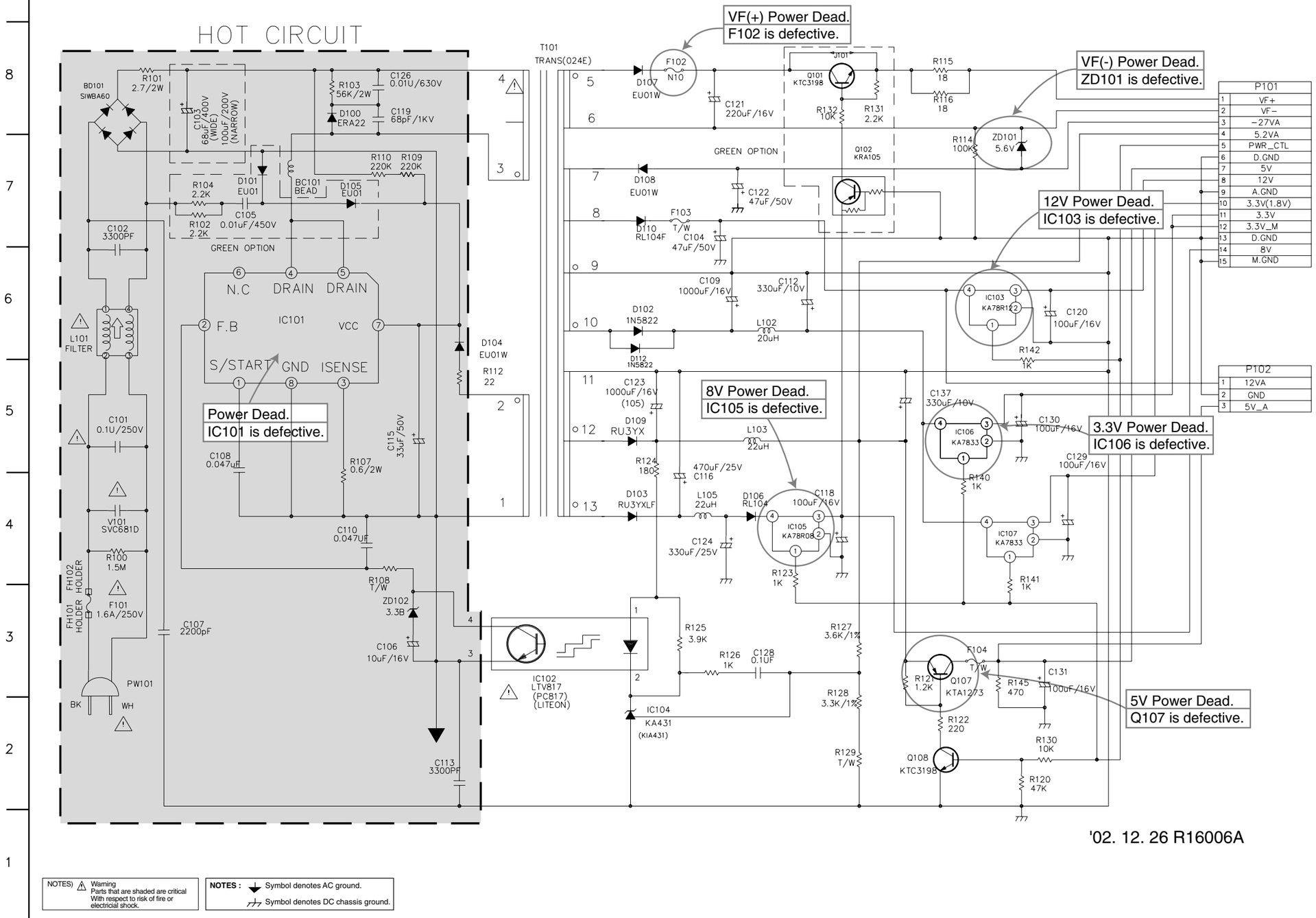
**IMPORTANT SAFETY NOTICE**

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE LG ELECTRONICS CORPORATION. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT. SPECIAL COMPONENTS ARE SHADED ON THE SCHEMATIC FOR EASY IDENTIFICATION.

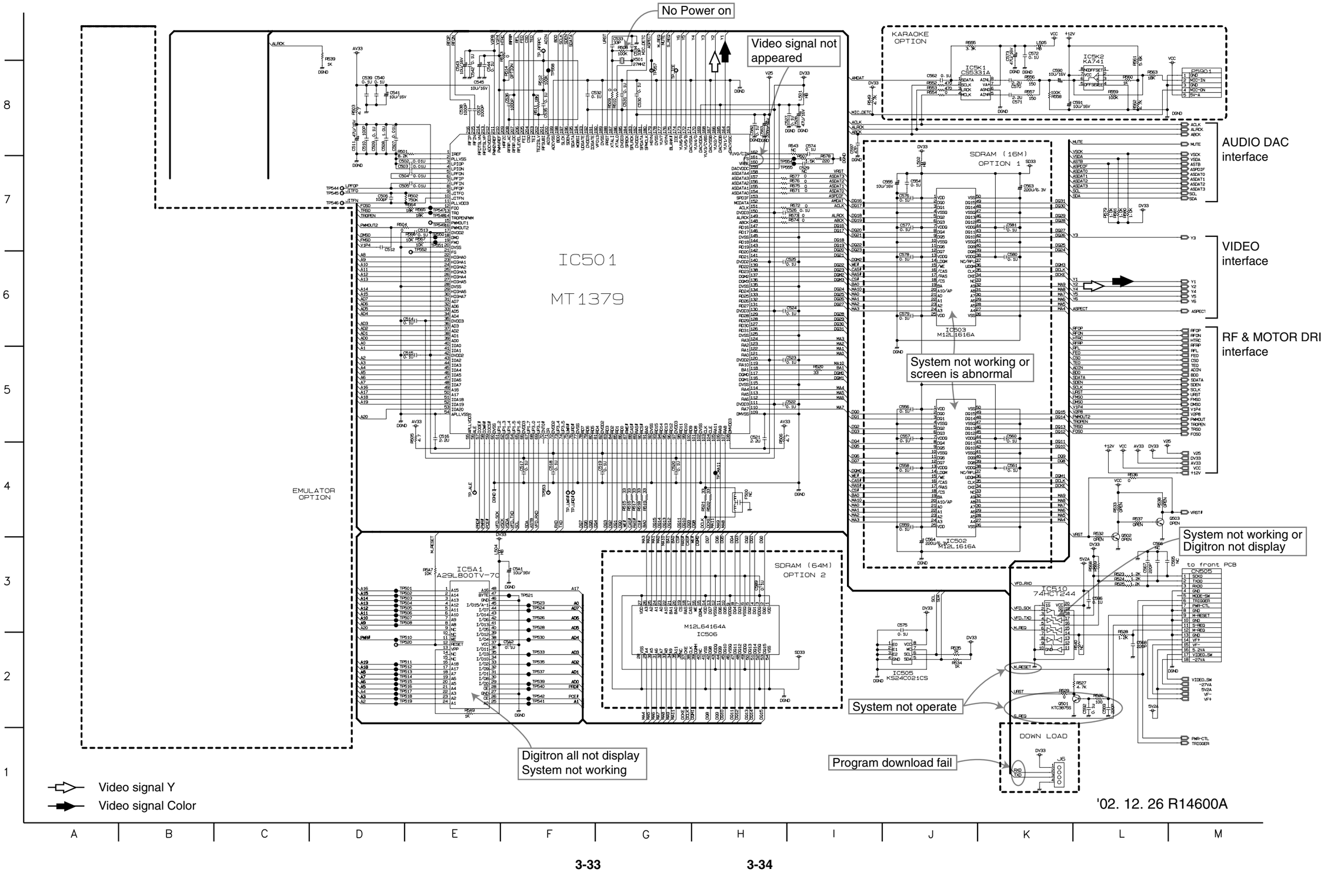
THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

**NOTE :**

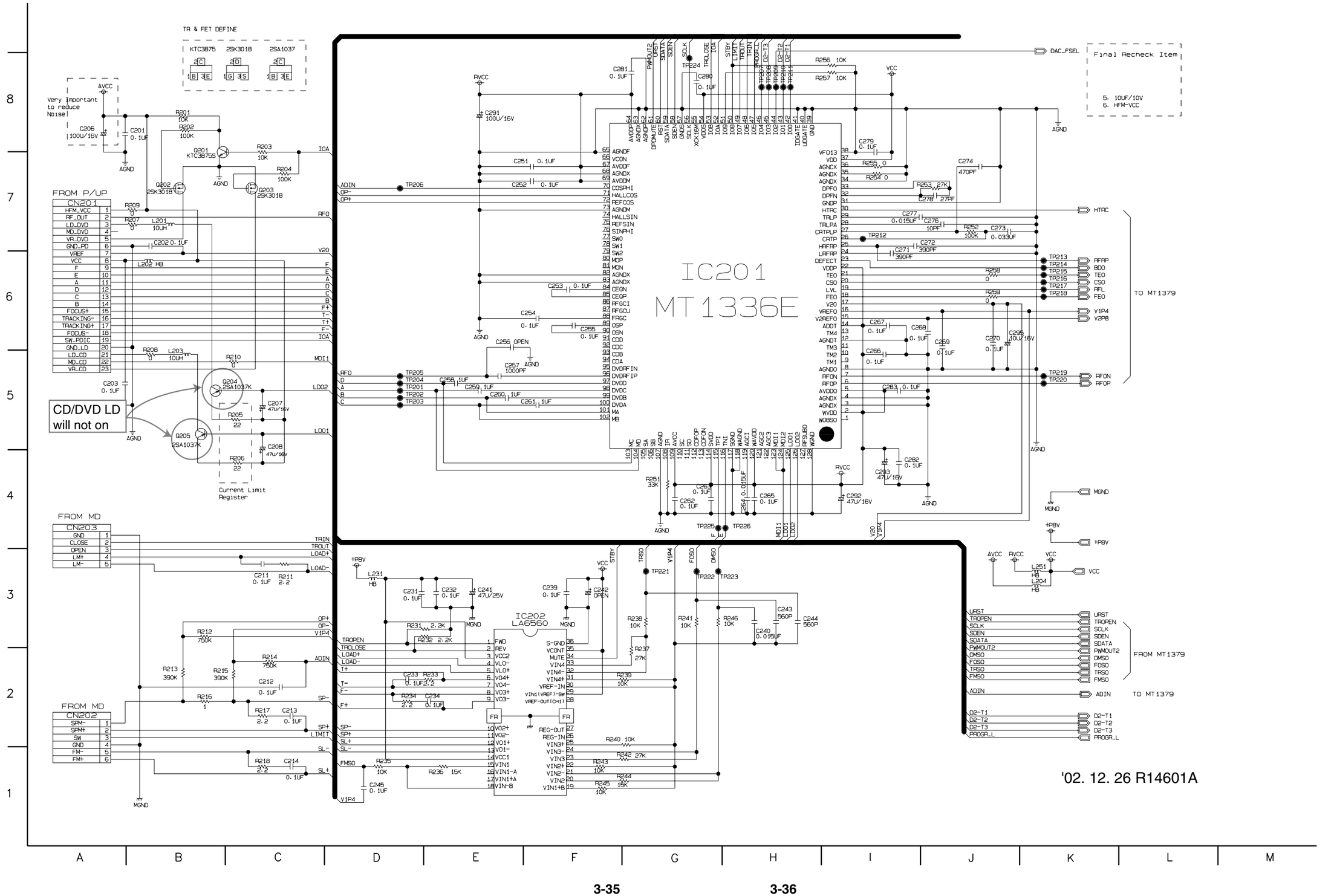
1. Shaded(■) parts are critical for safety. Replace only with specified part number.
2. Voltages are DC-measured with a digital voltmeter during Play mode.



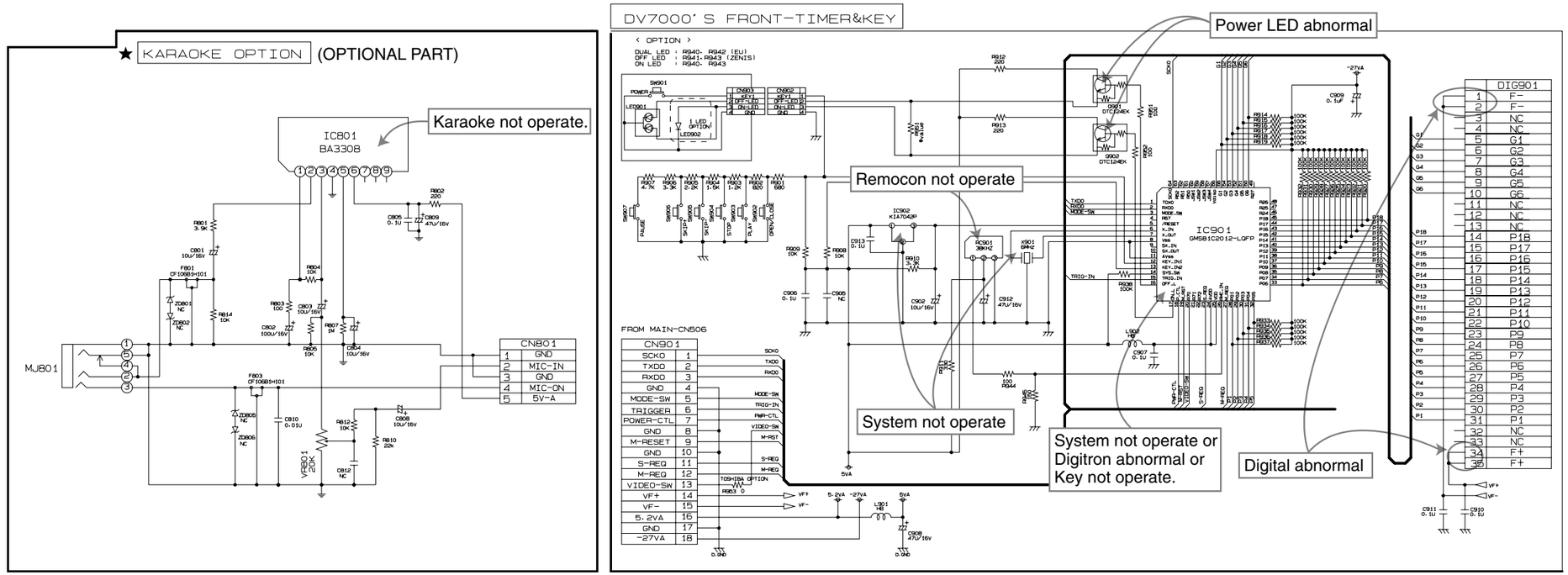
## 2. SYSTEM CIRCUIT DIAGRAM



# 3. RF & SERVO CIRCUIT DIAGRAM

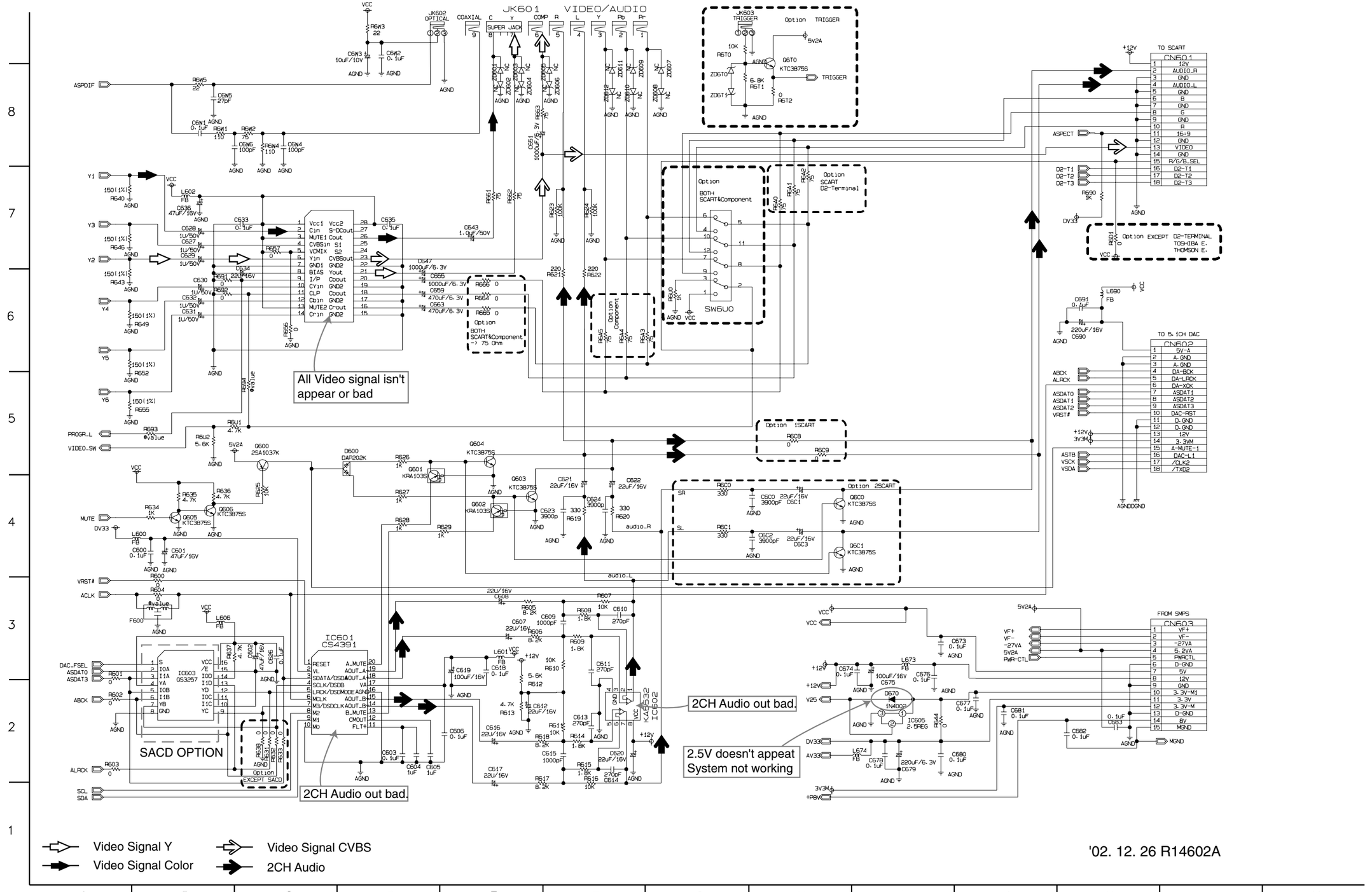


# 4. TIMER, 5.1CH, SCART, KARAOKE CIRCUIT DIAGRAM




'02. 12. 26 R14603A

# 5. AV/JACK CIRCUIT DIAGRAM



# • CIRCUIT VOLTAGE CHART

| | IC201(MT1336E) | | IC202(MOTOR) | | IC501(MT1379) | | IC502(SDRAM) | | IC505(EEPROM) | | IC510(BUFFER) | | IC5A1(FLASH) | | IC5K1(KARAOKE) | | IC601(CS4391) | | IC602(AMP) | | IC604(MM1623XFBE) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIN | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY |
| 1 | 1.03 | 2.99 | 0 | 0 | 1.22 | 1.22 | 3.27 | 3.28 | 0 | 0 | 0 | 0 | 0.08 | 0.16 | 2 | 0 | 3.28 | 3.29 | 5.52 | 5.49 | 5.09 | 5.08 |
| 2 | 5.11 | 5.08 | 0 | 0 | 0 | 0 | 1.18 | 1.26 | 0 | 0 | 2.59 | 2.55 | 1.82 | 0.45 | 1.64 | 1.63 | 3.28 | 3.28 | 5.52 | 5.48 | 2.43 | 2.42 |
| 3 | 0 | 0 | 8.04 | 8.01 | 0.96 | 0.9 | 1.1 | 1.52 | 0 | 0 | 0 | 0 | 2.84 | 0 | 1.64 | 1.64 | 0 | 1.65 | 5.51 | 5.47 | 5.09 | 5.08 |
| 4 | 0 | 0 | 0.12 | 0.06 | 2 | 2.06 | 0 | 0 | 0 | 0 | 2.59 | 2.56 | 2.83 | 3.12 | 1.58 | 1.56 | 1.63 | 1.64 | 0 | 0 | 1.45 | 0 |
| 5 | 5.11 | 5.07 | 0 | 0.06 | 0 | 1.51 | 0.66 | 1.07 | 3.28 | 3.29 | 0 | 0 | 0.69 | 0.26 | 2.23 | 2.23 | 1.64 | 1.65 | 5.51 | 5.48 | 0 | 0 |
| 6 | 0 | 1.95 | 3.64 | 3.69 | 1.48 | 1.47 | 0.85 | 1.12 | 3.28 | 3.29 | 3.24 | 3.23 | 1.72 | 0.25 | 0 | 0 | 1.59 | 1.61 | 5.51 | 5.48 | 1.45 | 1.69 |
| 7 | 0 | 0 | 3.62 | 3.61 | 0 | 1.56 | 3.27 | 3.28 | 0 | 0 | 0 | 0 | 1.92 | 0.9 | 5.12 | 5.08 | 0 | 0 | 5.52 | 5.47 | 0 | 0 |
| 8 | 0 | 0 | 3.64 | 3.53 | 3.2 | 1.52 | 0.51 | 0.97 | 3.28 | 3.29 | 0.14 | 0.08 | 1.7 | 1.45 | 2.23 | 2.23 | 3.28 | 0 | 12.03 | 12.03 | 2.47 | 2.46 |
| 9 | 5.11 | 0 | 3.6 | 3.76 | 0.12 | 0.06 | 3.06 | 0 | | | 0 | 0 | 0 | 0 | | | 3.28 | 3.29 | | | 0 | 0 |
| 10 | 5.11 | 5.08 | 3.62 | 2.43 | 0.12 | 0.06 | 0 | 0 | | | 0 | 0 | 0 | 0 | | | 0 | 0 | | | 1.14 | 1.76 |
| 11 | 5.11 | 5.08 | 3.63 | 4.85 | 3.25 | 3.25 | 0.06 | 0.98 | | | 0.15 | 0.09 | 3.27 | 3.29 | | | 5.01 | 5.01 | | | 0 | 0 |
| 12 | 0 | 0 | 3.62 | 3.72 | 1.41 | 1.49 | 3.18 | 0.87 | | | 0 | 0 | 3.56 | 3.55 | | | 2.31 | 2.31 | | | 2.42 | 2.42 |
| 13 | 5.11 | 0 | 3.64 | 3.57 | 1.41 | 1.41 | 3.27 | 3.28 | | | 0.15 | 0.08 | 3.29 | 3.29 | | | 4.96 | 0 | | | 5.09 | 5.08 |
| 14 | 5.11 | 5.08 | 8.04 | 8.01 | 0 | 0 | 2.94 | 2.56 | | | 5.19 | 5.19 | 0 | 0 | | | 1.42 | 2.41 | | | 2.43 | 2.42 |
| 15 | 2.84 | 2.81 | 1.45 | 1.48 | 1.42 | 1.42 | 0.47 | 0.42 | | | 0.14 | 0.09 | 0.23 | 0.06 | | | 2.4 | 2.39 | | | 0 | 0 |
| 16 | 1.45 | 1.43 | 0.27 | 1.39 | 3.3 | 0 | 2.93 | 3.01 | | | 5.25 | 5.24 | 0 | 0 | | | 0 | 0 | | | 2.49 | 2.47 |
| 17 | 2.08 | 2.07 | 0.29 | 1.32 | 2.53 | 2.53 | 3.21 | 3.22 | | | 0.15 | 0.08 | 0 | 0 | | | 5.11 | 5.09 | | | 0 | 0 |
| 18 | 1.37 | 1.42 | 1.45 | 1.43 | 1.42 | 2.27 | 2.87 | 2.95 | | | 5.23 | 5.23 | 0 | 0.87 | | | 2.41 | 2.41 | | | 2.48 | 2.47 |
| 19 | 0.69 | 2.3 | 1.45 | 1.43 | 1.42 | 1.39 | 0.15 | 1.32 | | | 0 | 0 | 1.98 | 2.64 | | | 2.43 | 2.43 | | | 0 | 0 |
| 20 | 2.4 | 0 | 1.45 | 0.82 | 0 | 0 | 0 | 0.05 | | | 5.25 | 5.25 | 2.28 | 2.18 | | | 0 | 0 | | | 1.18 | 2.3 |
| 21 | 2.35 | 0 | 1.45 | 1.43 | 2.61 | 2.58 | 3.09 | 1.32 | | | | | 2.13 | 1.96 | | | | | | | 1.76 | 2.17 |
| 22 | 5.11 | 5.08 | 1.45 | 1.43 | 0.75 | 1.46 | 3.09 | 1.32 | | | | | 1.67 | 2.01 | | | | | | | 0 | 0 |
| 23 | 0 | 0 | 1.47 | 1.37 | 2.83 | 1 | 3.09 | 1.32 | | | | | 1.99 | 1.72 | | | | | | | 1.76 | 2.24 |
| 24 | 2.59 | 3.2 | 1.45 | 1.43 | 1.9 | 0.89 | 3.09 | 1.33 | | | | | 1.93 | 2.19 | | | | | | | 0 | 0 |
| 25 | 0.19 | 1.88 | 1.45 | 1.43 | 1.72 | 0.39 | 3.27 | 3.29 | | | | | 2.05 | 1.94 | | | | | | | 0 | 0 |
| 26 | 1.58 | 0 | 0.95 | 0.91 | 0.68 | 0.31 | 0 | 0 | | | | | 0 | 0 | | | | | | | 0 | 0 |
| 27 | 2.56 | 3.13 | 0 | 0 | 2.84 | 3.16 | 0.15 | 1.36 | | | | | 0 | 0 | | | | | | | 0.06 | 0.05 |
| 28 | 2 | 2.01 | 1.45 | 1.43 | 0 | 0 | 1.84 | 2.36 | | | | | 0 | 0 | | | | | | | 5.09 | 0 |
| 29 | 2 | 2.06 | 5.15 | 5.11 | 2.85 | 0.66 | 1 | 2.32 | | | | | 1.49 | 2.03 | | | | | | | | |
| 30 | 2.96 | 1.52 | 1.45 | 1.43 | 1.83 | 0.49 | 0.54 | 1.75 | | | | | 0.16 | 1.07 | | | | | | | | |
| 31 | 0 | 0 | 1.45 | 1.43 | 0.91 | 1.39 | 0.06 | 0.06 | | | | | 1.96 | 1.25 | | | | | | | | |
| 32 | 0.06 | 2.07 | 1.45 | 1.43 | 1.43 | 1.2 | 0.05 | 0.06 | | | | | 0.16 | 1.1 | | | | | | | | |
| 33 | 0.07 | 2.07 | 1.46 | 1.45 | 1.51 | 1.57 | 0 | 0 | | | | | 0.99 | 2.2 | | | | | | | | |
| 34 | 0 | 0 | 5.08 | 5.06 | 1.51 | 1.43 | 0.73 | 1.26 | | | | | 1.17 | 1.07 | | | | | | | | |
| 35 | 0 | 0 | 5.15 | 5.11 | 3.3 | 3.29 | 1.48 | 1.55 | | | | | 0.79 | 1.82 | | | | | | | | |
| 36 | 0 | 0 | 0 | 0 | 0.81 | 1.26 | 2.91 | 2.53 | | | | | 0.15 | 1.07 | | | | | | | | |
| 37 | 5.13 | 0 | | | 1.45 | 1.02 | 0.07 | 0 | | | | | 3.29 | 3.3 | | | | | | | | |
| 38 | 0 | 0 | | | 1.82 | 1.6 | 3.27 | 3.28 | | | | | 1.93 | 3.09 | | | | | | | | |
| 39 | 0 | 0 | | | 1.2 | 1.5 | 1.06 | 1.05 | | | | | 0.16 | 1.07 | | | | | | | | |
| 40 | 0 | 0 | | | 2 | 2.06 | 0.47 | 0.98 | | | | | 1.5 | 2.2 | | | | | | | | |
| 41 | 0 | 0 | | | 2.17 | 1.95 | 0 | 0 | | | | | 0.16 | 1.07 | | | | | | | | |
| 42 | 5.12 | 5.09 | | | 2.53 | 2.52 | 0 | 0.6 | | | | | 1.21 | 2.64 | | | | | | | | |
| 43 | 5.12 | 5.09 | | | 1.96 | 1.9 | 1.12 | 1.24 | | | | | 0.16 | 1.08 | | | | | | | | |
| 44 | 5.12 | 5.09 | | | 1.79 | 1.9 | 3.27 | 3.28 | | | | | 1.64 | 1.48 | | | | | | | | |
| 45 | 5.12 | 5.09 | | | 0.8 | 1.72 | 1.21 | 0.99 | | | | | 2.05 | 2.06 | | | | | | | | |
| 46 | 5.12 | 5.09 | | | 0.8 | 1.96 | 1.31 | 1.34 | | | | | 0 | 0 | | | | | | | | |
| 47 | 0 | 0 | | | 0.8 | 1.84 | 0 | 0 | | | | | 0 | 0 | | | | | | | | |
| 48 | 5.12 | 5.09 | | | 3.3 | 2.63 | 1.43 | 1.44 | | | | | 0.07 | 0.13 | | | | | | | | |
| 49 | 5.12 | 0 | | | 0 | 0.13 | 0.88 | 1.01 | | | | | | | | | | | | | | |
| 50 | 5.08 | 5.06 | | | 0 | 0.07 | 0 | 0 | | | | | | | | | | | | | | |
| 51 | 5.09 | 5.07 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 52 | 5.1 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 53 | 0 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 54 | 5.13 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 55 | 0.09 | 0.2 | | | 3.25 | 3.27 | | | | | | | | | | | | | | | | |
| 56 | 1.61 | 0 | | | 1.21 | 1.18 | | | | | | | | | | | | | | | | |
| 57 | 0 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 58 | 0 | 0 | | | 3.29 | 3.29 | | | | | | | | | | | | | | | | |
| 59 | 0 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 60 | 0 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 61 | 3.28 | 0 | | | 2.59 | 2.57 | | | | | | | | | | | | | | | | |
| 62 | 0 | 0 | | | 2.58 | 2.58 | | | | | | | | | | | | | | | | |
| 63 | 0 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 64 | 0 | 0 | | | 2.59 | 2.56 | | | | | | | | | | | | | | | | |
| 65 | 0 | 0 | | | 3.29 | 3.29 | | | | | | | | | | | | | | | | |
| 66 | 0.26 | 0 | | | 3.3 | 3.29 | | | | | | | | | | | | | | | | |
| 67 | 5.12 | 5.08 | | | 3.29 | 3.29 | | | | | | | | | | | | | | | | |
| 68 | 0 | 0 | | | 2.57 | 2.56 | | | | | | | | | | | | | | | | |
| 69 | 5.12 | 0 | | | 5.19 | 5.18 | | | | | | | | | | | | | | | | |
| 70 | 3.21 | 2.03 | | | 2.59 | 2.57 | | | | | | | | | | | | | | | | |
| 71 | 3.46 | 2.2 | | | 0.12 | 0.08 | | | | | | | | | | | | | | | | |
| 72 | 2.81 | 0 | | | 2.53 | 2.52 | | | | | | | | | | | | | | | | |
| 73 | 0 | 0 | | | 2.59 | 2.57 | | | | | | | | | | | | | | | | |
| 74 | 0.21 | 0.09 | | | 3.29 | 3.29 | | | | | | | | | | | | | | | | |
| 75 | 0.22 | 0 | | | 2.61 | 2.61 | | | | | | | | | | | | | | | | |
| 76 | 0 | 0.1 | | | 3.27 | 3.24 | | | | | | | | | | | | | | | | |
| 77 | 0.21 | 0.09 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 78 | 0.23 | 0.09 | | | 0.94 | 1.04 | | | | | | | | | | | | | | | | |
| 79 | 0.21 | 0.08 | | | 0.78 | 1.06 | | | | | | | | | | | | | | | | |
| 80 | 0.23 | 0.08 | | | 0.89 | 1.15 | | | | | | | | | | | | | | | | |



| | IC201(MT1336E) | | IC202(MOTOR) | | IC501(MT1379) | | IC502(SDRAM) | | IC505(EEPROM) | | IC510(BUFFER) | | IC5A1(FLASH) | | IC5K1(KARAOKE) | | IC601(CS4391) | | IC602(AMP) | | IC604(MM1623XFBE) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIN | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY |
| 81 | 0.22 | 0 | | | 0.99 | 1.34 | | | | | | | | | | | | | | | | |
| 82 | 0 | 0 | | | 2.52 | 2.52 | | | | | | | | | | | | | | | | |
| 83 | 0 | 0 | | | 3.09 | 1.33 | | | | | | | | | | | | | | | | |
| 84 | 0.07 | 0 | | | 0.37 | 1.16 | | | | | | | | | | | | | | | | |
| 85 | 0.07 | 2.27 | | | 3.08 | 1.1 | | | | | | | | | | | | | | | | |
| 86 | 1.97 | 0 | | | 3.07 | 1.08 | | | | | | | | | | | | | | | | |
| 87 | 1.96 | 1.9 | | | 0.59 | 1.04 | | | | | | | | | | | | | | | | |
| 88 | 1.54 | 1.71 | | | 1.57 | 2.53 | | | | | | | | | | | | | | | | |
| 89 | 0.19 | 2.22 | | | 3.2 | 3.13 | | | | | | | | | | | | | | | | |
| 90 | 0.21 | 0 | | | 2.77 | 2.53 | | | | | | | | | | | | | | | | |
| 91 | 0.22 | 0.06 | | | 0.22 | 1.68 | | | | | | | | | | | | | | | | |
| 92 | 0.22 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 93 | 0.23 | 0.06 | | | 3.32 | 1 | | | | | | | | | | | | | | | | |
| 94 | 0.23 | 0.06 | | | 0.16 | 1.58 | | | | | | | | | | | | | | | | |
| 95 | 2.28 | 0 | | | 3.31 | 1.62 | | | | | | | | | | | | | | | | |
| 96 | 2.28 | 2.25 | | | 3.3 | 1.08 | | | | | | | | | | | | | | | | |
| 97 | 2.27 | 1.23 | | | 3.3 | 3.29 | | | | | | | | | | | | | | | | |
| 98 | 2.27 | 2.23 | | | 3.32 | 1.62 | | | | | | | | | | | | | | | | |
| 99 | 2.27 | 2.23 | | | 0.16 | 1.09 | | | | | | | | | | | | | | | | |
| 100 | 2.26 | 2.23 | | | 3.32 | 1.27 | | | | | | | | | | | | | | | | |
| 101 | 2.08 | 2.17 | | | 3.3 | 1.32 | | | | | | | | | | | | | | | | |
| 102 | 2.07 | 2.17 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 103 | 2.07 | 2.18 | | | 1.56 | 1.55 | | | | | | | | | | | | | | | | |
| 104 | 2.08 | 0 | | | 0.94 | 1.25 | | | | | | | | | | | | | | | | |
| 105 | 0.14 | 0.15 | | | 0.41 | 0 | | | | | | | | | | | | | | | | |
| 106 | 0.14 | 0.16 | | | 0.05 | 0.06 | | | | | | | | | | | | | | | | |
| 107 | 0 | 0 | | | 0 | 0.06 | | | | | | | | | | | | | | | | |
| 108 | 1.28 | 1.28 | | | 3.27 | 3.26 | | | | | | | | | | | | | | | | |
| 109 | 5.18 | 5.05 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 110 | 0.14 | 0.16 | | | 0.19 | 1.74 | | | | | | | | | | | | | | | | |
| 111 | 0.15 | 0.15 | | | 3.3 | 3.29 | | | | | | | | | | | | | | | | |
| 112 | 0.13 | 0.16 | | | 0.18 | 1.62 | | | | | | | | | | | | | | | | |
| 113 | 0.14 | 0.15 | | | 2.98 | 2.38 | | | | | | | | | | | | | | | | |
| 114 | 5.1 | 5.05 | | | 3.02 | 1.48 | | | | | | | | | | | | | | | | |
| 115 | 2.07 | 2.09 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 116 | 2.06 | 2.09 | | | 2.86 | 3.01 | | | | | | | | | | | | | | | | |
| 117 | 0 | 0 | | | 2.86 | 2.54 | | | | | | | | | | | | | | | | |
| 118 | 0 | 0 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 119 | 0 | 0 | | | 0 | 2.5 | | | | | | | | | | | | | | | | |
| 120 | 5.1 | 5.05 | | | 2.55 | 2.51 | | | | | | | | | | | | | | | | |
| 121 | 0.13 | 0.15 | | | 3.03 | 1.4 | | | | | | | | | | | | | | | | |
| 122 | 0.14 | 0.15 | | | 3.03 | 1.4 | | | | | | | | | | | | | | | | |
| 123 | 0 | 0.18 | | | 0.22 | 1.39 | | | | | | | | | | | | | | | | |
| 124 | 0 | 0.18 | | | 0.22 | 0.34 | | | | | | | | | | | | | | | | |
| 125 | 5.08 | 5.03 | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 126 | 5.08 | 3.16 | | | 3.31 | 0.98 | | | | | | | | | | | | | | | | |
| 127 | 0.06 | 2.08 | | | 0.26 | 1.64 | | | | | | | | | | | | | | | | |
| 128 | 0 | 0 | | | 3.31 | 1.53 | | | | | | | | | | | | | | | | |
| 129 | | | | | 3.3 | 1.15 | | | | | | | | | | | | | | | | |
| 130 | | | | | 3.3 | 3.29 | | | | | | | | | | | | | | | | |
| 131 | | | | | 3.31 | 1.49 | | | | | | | | | | | | | | | | |
| 132 | | | | | 0.16 | 0.89 | | | | | | | | | | | | | | | | |
| 133 | | | | | 3.3 | 0 | | | | | | | | | | | | | | | | |
| 134 | | | | | 3.3 | 1.07 | | | | | | | | | | | | | | | | |
| 135 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 136 | | | | | 2.86 | 2.53 | | | | | | | | | | | | | | | | |
| 137 | | | | | 2.86 | 2.53 | | | | | | | | | | | | | | | | |
| 138 | | | | | 0.07 | 0.86 | | | | | | | | | | | | | | | | |
| 139 | | | | | 0.09 | 0.99 | | | | | | | | | | | | | | | | |
| 140 | | | | | 0.07 | 2.51 | | | | | | | | | | | | | | | | |
| 141 | | | | | 0.07 | 0.94 | | | | | | | | | | | | | | | | |
| 142 | | | | | 0.09 | 1.13 | | | | | | | | | | | | | | | | |
| 143 | | | | | 0.07 | 1.19 | | | | | | | | | | | | | | | | |
| 144 | | | | | 0.09 | 1.07 | | | | | | | | | | | | | | | | |
| 145 | | | | | 0.09 | 0 | | | | | | | | | | | | | | | | |
| 146 | | | | | 0 | 1.51 | | | | | | | | | | | | | | | | |
| 147 | | | | | 0.09 | 1.25 | | | | | | | | | | | | | | | | |
| 148 | | | | | 0.07 | 1.64 | | | | | | | | | | | | | | | | |
| 149 | | | | | 0.06 | 0 | | | | | | | | | | | | | | | | |
| 150 | | | | | 0 | 1.65 | | | | | | | | | | | | | | | | |
| 151 | | | | | 0.07 | 3.29 | | | | | | | | | | | | | | | | |
| 152 | | | | | 0 | 1.6 | | | | | | | | | | | | | | | | |
| 153 | | | | | 0 | 1.64 | | | | | | | | | | | | | | | | |
| 154 | | | | | 0 | 1.44 | | | | | | | | | | | | | | | | |
| 155 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 156 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 157 | | | | | 0 | 1.63 | | | | | | | | | | | | | | | | |
| 158 | | | | | 0 | 3.29 | | | | | | | | | | | | | | | | |
| 159 | | | | | 0 | 3.27 | | | | | | | | | | | | | | | | |
| 160 | | | | | 0 | 1.27 | | | | | | | | | | | | | | | | |

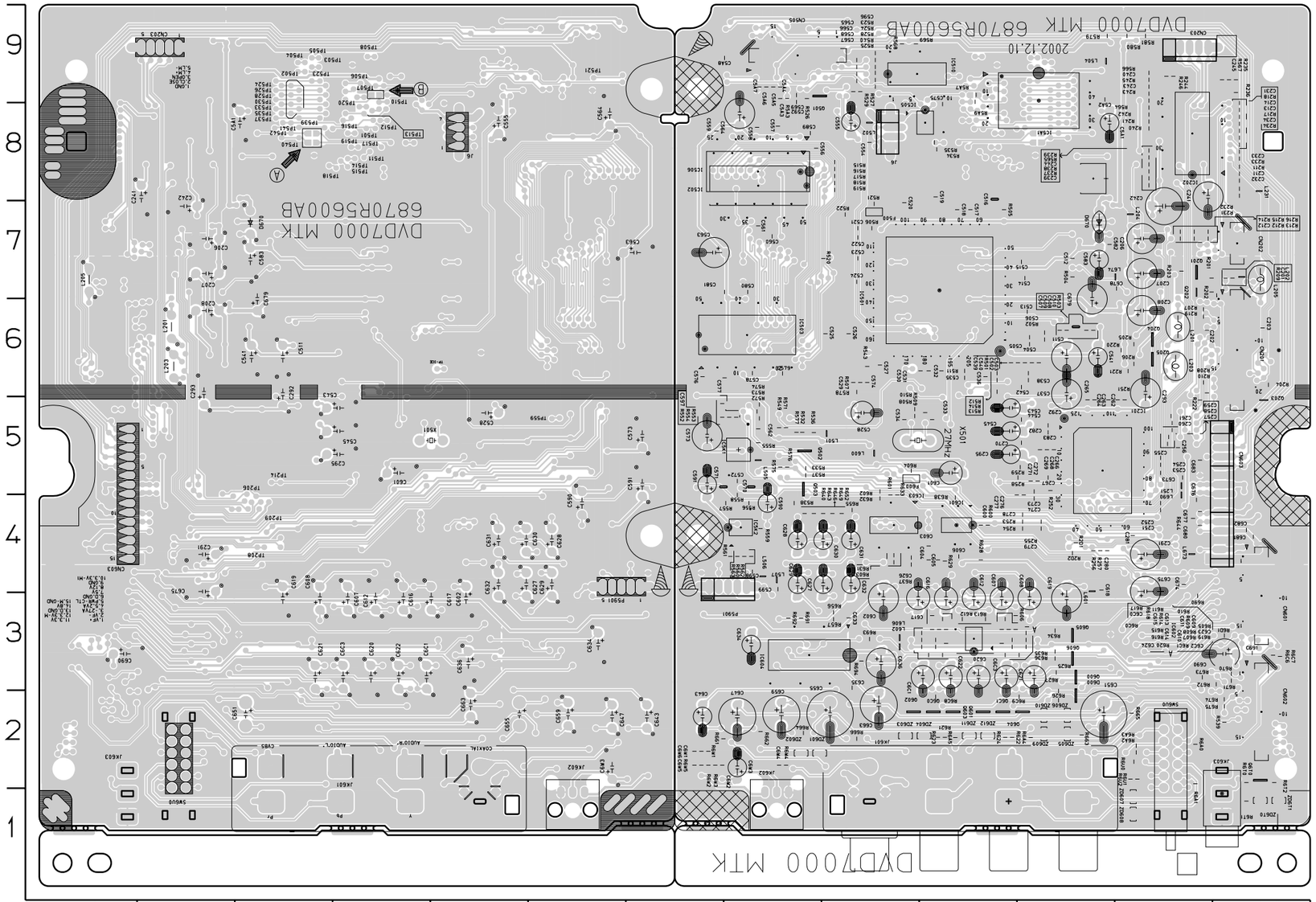
| | IC201(MT1336E) | | IC202(MOTOR) | | IC501(MT1379) | | IC502(SDRAM) | | IC505(EEPROM) | | IC510(BUFFER) | | IC5A1(FLASH) | | IC5K1(KARAOKE) | | IC601(CS4391) | | IC602(AMP) | | IC604(MM1623XFBE) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIN | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY |
| 161 | | | | | 0 | 1.27 | | | | | | | | | | | | | | | | |
| 162 | | | | | 0 | 2.35 | | | | | | | | | | | | | | | | |
| 163 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 164 | | | | | 0 | 0.73 | | | | | | | | | | | | | | | | |
| 165 | | | | | 0 | 3.27 | | | | | | | | | | | | | | | | |
| 166 | | | | | 0 | 0.5 | | | | | | | | | | | | | | | | |
| 167 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 168 | | | | | 0 | 0.53 | | | | | | | | | | | | | | | | |
| 169 | | | | | 0 | 3.27 | | | | | | | | | | | | | | | | |
| 170 | | | | | 0 | 0.59 | | | | | | | | | | | | | | | | |
| 171 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 172 | | | | | 3.01 | 0.72 | | | | | | | | | | | | | | | | |
| 173 | | | | | 0 | 0.72 | | | | | | | | | | | | | | | | |
| 174 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 175 | | | | | 0 | 2.73 | | | | | | | | | | | | | | | | |
| 176 | | | | | 0 | 3.13 | | | | | | | | | | | | | | | | |
| 177 | | | | | 0 | 3.13 | | | | | | | | | | | | | | | | |
| 178 | | | | | 0 | 3.25 | | | | | | | | | | | | | | | | |
| 179 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 180 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 181 | | | | | 2.04 | 2.64 | | | | | | | | | | | | | | | | |
| 182 | | | | | 0 | 2.52 | | | | | | | | | | | | | | | | |
| 183 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 184 | | | | | 0 | 0.09 | | | | | | | | | | | | | | | | |
| 185 | | | | | 0 | 3.26 | | | | | | | | | | | | | | | | |
| 186 | | | | | - | - | | | | | | | | | | | | | | | | |
| 187 | | | | | 0 | 0.08 | | | | | | | | | | | | | | | | |
| 188 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 189 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 190 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 191 | | | | | 0.23 | 0 | | | | | | | | | | | | | | | | |
| 192 | | | | | 0 | 3.29 | | | | | | | | | | | | | | | | |
| 193 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 194 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 195 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 196 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 197 | | | | | 0 | 1.63 | | | | | | | | | | | | | | | | |
| 198 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 199 | | | | | 0 | 0 | | | | | | | | | | | | | | | | |
| 200 | | | | | 0 | 2.15 | | | | | | | | | | | | | | | | |
| 201 | | | | | 0 | 1.44 | | | | | | | | | | | | | | | | |
| 202 | | | | | 0 | 1.44 | | | | | | | | | | | | | | | | |
| 203 | | | | | 0 | 1.43 | | | | | | | | | | | | | | | | |
| 204 | | | | | 0 | 1.43 | | | | | | | | | | | | | | | | |
| 205 | | | | | 0 | 1.42 | | | | | | | | | | | | | | | | |
| 206 | | | | | 0 | 2.1 | | | | | | | | | | | | | | | | |
| 207 | | | | | 0 | 2.07 | | | | | | | | | | | | | | | | |
| 208 | | | | | 0 | 1.41 | | | | | | | | | | | | | | | | |
| 209 | | | | | 0 | 1.52 | | | | | | | | | | | | | | | | |
| 210 | | | | | 0 | 1.43 | | | | | | | | | | | | | | | | |
| 211 | | | | | 0 | 2.81 | | | | | | | | | | | | | | | | |
| 212 | | | | | 0 | 3.28 | | | | | | | | | | | | | | | | |
| 213 | | | | | 0 | 0.12 | | | | | | | | | | | | | | | | |
| 214 | | | | | 0 | 0.12 | | | | | | | | | | | | | | | | |
| 215 | | | | | 1.02 | 1.43 | | | | | | | | | | | | | | | | |
| 216 | | | | | 0 | 1.43 | | | | | | | | | | | | | | | | |



| | Q201 | | Q202 | | Q203 | | Q204 | | Q205 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY |
| E | 0 | 0 | 0 | 0 | 0 | 0 | 5.14 | 4.34 | 5.14 | 5.1 |
| C | 0 | 5.09 | 0 | 0 | 0 | 0.19 | 0 | 2.42 | 0.5 | 0 |
| B | 0.68 | 0 | 0 | 5.04 | 5.04 | 0 | 5.08 | 3.64 | 5.08 | 5.05 |
| | Q501 | | Q600 | | Q603 | | Q604 | | Q605 | |
| | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY | STOP | PLAY |
| E | 0 | 0 | 5.17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C | 0 | 0 | 0 | 0.13 | 0 | 0 | 0 | 0 | 0 | 0 |
| B | 0.83 | 0.83 | 5.11 | 0 | 0.75 | 0 | 0.75 | 0.16 | 0.74 | 0.74 |

# PRINTED CIRCUIT DIAGRAMS

## 1. MAIN P.C.BOARD

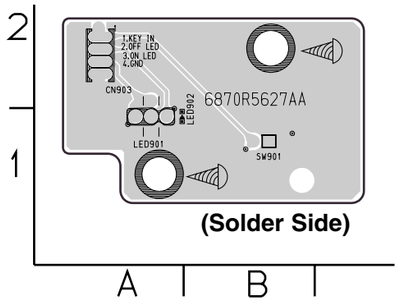



### LOCATION GUIDE

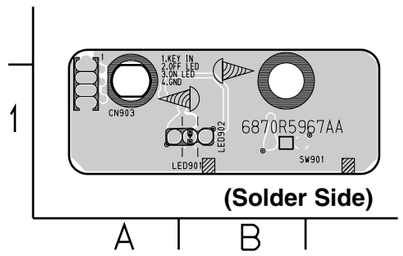
| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP-ICE | E6 | C201 | M7 | C506 | K6 | C575 | J8 | C643 | G2 | L202 | M7 | R232 | M8 | R538 | H4 | R624 | J2 | R6W3 | G2 |
| TP201 | A6 | C202 | L6 | C507 | K6 | C576 | G6 | C647 | H2 | L203 | L6 | R233 | M8 | R539 | M2 | R625 | K3 | R6W4 | H2 |
| TP202 | B6 | C203 | M6 | C508 | K6 | C577 | H6 | C651 | K2 | L204 | L7 | R234 | M8 | R540 | I9 | R626 | K2 | R6W5 | G2 |
| TP203 | B6 | C206 | L7 | C509 | K6 | C578 | H6 | C655 | I2 | L205 | M7 | R235 | M9 | R543 | I6 | R627 | K2 | SW6U0 | L2 |
| TP204 | B5 | C207 | L7 | C510 | K6 | C579 | H6 | C659 | H2 | L231 | M8 | R236 | M9 | R549 | H5 | R628 | J4 | TP207 | K4 |
| TP205 | A6 | C208 | L6 | C511 | K6 | C580 | H7 | C663 | I2 | L251 | L5 | R237 | L8 | R552 | G5 | R629 | J4 | TP210 | K4 |
| TP206 | C4 | C211 | M8 | C512 | K7 | C581 | H7 | C673 | L5 | L501 | I5 | R238 | L8 | R553 | H5 | R631 | J4 | TP211 | K4 |
| TP208 | C4 | C212 | L7 | C513 | K6 | C582 | K7 | C674 | L4 | L502 | I8 | R239 | L8 | R554 | H5 | R632 | J4 | TP212 | K5 |
| TP209 | C4 | C213 | M8 | C514 | K7 | C583 | K7 | C675 | L4 | L504 | K9 | R240 | L8 | R555 | H5 | R633 | J4 | TP213 | J5 |
| TP214 | C5 | C214 | M8 | C515 | K7 | C589 | H8 | C676 | L4 | L505 | H5 | R241 | L8 | R556 | H4 | R634 | K3 | TP215 | J5 |
| TP225 | B6 | C231 | M8 | C516 | J8 | C590 | H4 | C677 | L4 | L506 | H4 | R242 | L8 | R557 | H4 | R635 | K3 | TP216 | J5 |
| TP226 | B6 | C232 | M8 | C517 | J7 | C591 | G5 | C678 | L7 | L507 | H4 | R243 | L9 | R558 | H4 | R636 | K3 | TP217 | K5 |
| TP501 | D8 | C233 | M8 | C518 | J7 | C592 | H9 | C679 | K6 | L600 | I5 | R244 | L9 | R559 | H4 | R637 | I4 | TP218 | J5 |
| TP502 | C9 | C234 | M8 | C519 | J8 | C596 | I9 | C680 | L4 | L601 | K4 | R245 | L9 | R560 | H4 | R638 | J4 | TP219 | K6 |
| TP503 | C9 | C239 | L8 | C520 | I7 | C597 | G5 | C681 | M4 | L602 | I3 | R246 | L9 | R561 | H4 | R640 | H4 | TP220 | K6 |
| TP504 | C9 | C240 | L9 | C521 | I7 | C598 | H4 | C682 | M4 | L606 | I3 | R251 | L5 | R562 | H4 | R643 | H4 | TP221 | L8 |
| TP505 | C9 | C241 | L8 | C522 | I7 | C599 | H4 | C683 | L5 | L673 | L4 | R252 | K5 | R563 | H4 | R644 | L4 | TP222 | L8 |
| TP506 | D9 | C242 | L7 | C523 | I7 | C5A1 | K8 | C690 | M3 | L674 | L7 | R253 | K4 | R564 | L8 | R646 | I4 | TP223 | L9 |
| TP507 | D9 | C243 | L9 | C524 | I7 | C5A2 | K9 | C691 | M3 | L690 | L4 | R254 | K4 | R565 | L8 | R649 | I4 | TP224 | K4 |
| TP508 | D9 | C244 | L8 | C525 | I6 | C5A3 | H9 | C6C0 | J3 | P5901 | H4 | R255 | K4 | R566 | L9 | R652 | I4 | TP544 | K6 |
| TP510 | D9 | C245 | M9 | C526 | I6 | C5A4 | H9 | C6C1 | J3 | Q201 | L7 | R256 | K4 | R567 | M9 | R655 | I4 | TP545 | K6 |
| TP511 | D8 | C251 | L4 | C527 | I6 | C5A5 | H9 | C6C2 | K3 | Q202 | L7 | R257 | K4 | R568 | I9 | R656 | I3 | TP546 | K6 |
| TP512 | D8 | C252 | L4 | C528 | I5 | C5A6 | H9 | C6C3 | J3 | Q203 | M5 | R258 | K5 | R569 | I9 | R657 | I3 | TP547 | L8 |
| TP513 | D8 | C253 | L5 | C529 | I6 | C5A7 | H9 | C6W1 | G2 | Q204 | L6 | R259 | K5 | R571 | H5 | R661 | G2 | TP548 | L8 |
| TP514 | D8 | C254 | L5 | C530 | J6 | C5A8 | H9 | C6W2 | G2 | Q205 | L6 | R201 | K4 | R572 | H5 | R662 | H2 | TP549 | J6 |
| TP515 | D8 | C255 | L5 | C531 | J6 | C600 | J4 | C6W3 | H2 | Q501 | H9 | R202 | K4 | R573 | H5 | R663 | K2 | TP550 | L9 |
| TP516 | D8 | C256 | L5 | C532 | J6 | C601 | J5 | C6W4 | H2 | Q502 | H5 | R501 | K6 | R574 | H5 | R664 | H2 | TP551 | M9 |
| TP517 | D8 | C257 | L5 | C533 | J5 | C602 | I3 | C6W5 | G2 | Q503 | H5 | R502 | K6 | R575 | H5 | R665 | L2 | TP552 | K8 |
| TP518 | D8 | C258 | L5 | C534 | I5 | C603 | J4 | C6W6 | G2 | Q600 | K3 | R503 | K6 | R576 | H5 | R666 | I2 | TP553 | J8 |
| TP519 | D8 | C259 | L5 | C535 | J6 | C604 | J4 | CN201 | M6 | Q601 | J2 | R504 | K7 | R577 | H5 | R670 | M3 | TP554 | I6 |
| TP520 | D9 | C260 | L5 | C536 | J6 | C605 | J4 | CN202 | M7 | Q602 | I2 | R505 | J7 | R578 | I6 | R671 | M3 | TP555 | I6 |
| TP521 | F9 | C261 | L5 | C537 | K6 | C606 | J4 | CN203 | L9 | Q603 | I2 | R506 | I7 | R579 | K9 | R672 | M3 | TP557 | K6 |
| TP523 | C9 | C262 | L5 | C538 | K6 | C607 | J3 | CN505 | H9 | Q604 | K2 | R507 | I6 | R580 | L9 | R673 | L3 | TP558 | J6 |
| TP524 | C9 | C263 | K5 | C539 | J6 | C608 | K3 | CN601 | M3 | Q605 | K3 | R508 | I5 | R581 | L9 | R674 | M2 | TP:ALE | J7 |
| TP526 | C9 | C264 | K5 | C540 | K6 | C609 | J3 | CN602 | M2 | Q606 | K3 | R509 | J5 | R5A3 | H9 | R675 | M2 | TP:MA11 | I7 |
| TP528 | C9 | C265 | K5 | C541 | K6 | C610 | J3 | CN603 | M6 | Q6C0 | J2 | R510 | I5 | R5A7 | J9 | R690 | L3 | TP:RFRPO6 | |
| TP530 | C9 | C266 | K5 | C542 | K6 | C611 | J3 | D600 | K2 | Q6C1 | J2 | R511 | J6 | R5A9 | J9 | R691 | H3 | TP:URD# | J8 |
| TP533 | C8 | C267 | K5 | C543 | J5 | C612 | J3 | D670 | K7 | Q670 | M2 | R512 | J6 | R600 | J4 | R692 | H3 | TP:UWR# | J8 |
| TP535 | C8 | C268 | K5 | C544 | K5 | C613 | J3 | F500 | I7 | R201 | L7 | R513 | J6 | R601 | I4 | R693 | I3 | X501 | I5 |
| TP537 | C8 | C269 | K5 | C545 | J5 | C614 | J3 | F600 | I5 | R202 | L7 | R514 | J6 | R602 | I5 | R694 | I3 | ZD601 | H2 |
| TP539 | C8 | C270 | K5 | C554 | I8 | C615 | J3 | IC201 | K5 | R203 | L7 | R515 | I8 | R603 | I4 | R6A0 | L2 | ZD602 | H2 |
| TP540 | C8 | C271 | K5 | C555 | I8 | C616 | J3 | IC202 | L8 | R204 | M6 | R516 | I8 | R604 | I5 | R6A1 | L2 | ZD603 | J2 |
| TP541 | C8 | C272 | K5 | C556 | H8 | C617 | I3 | IC501 | J7 | R205 | L6 | R517 | I8 | R605 | K3 | R6A2 | L2 | ZD604 | J2 |
| TP542 | C8 | C273 | K5 | C557 | H8 | C618 | K4 | IC502 | H8 | R206 | L6 | R518 | I8 | R606 | J3 | R6A3 | L2 | ZD605 | K2 |
| TP559 | F5 | C274 | K4 | C558 | H8 | C619 | K3 | IC503 | H6 | R207 | L6 | R519 | I8 | R607 | J3 | R6A4 | K2 | ZD606 | K2 |
| | | C276 | K4 | C559 | G8 | C620 | J3 | IC505 | J8 | R208 | L6 | R520 | I7 | R608 | J3 | R6A5 | J2 | ZD607 | L1 |
| | | C277 | J4 | C560 | H7 | C621 | K3 | IC506 | H8 | R209 | M7 | R521 | I7 | R609 | J3 | R6C0 | J3 | ZD608 | L1 |
| | | C278 | K4 | C561 | H7 | C622 | J3 | IC510 | I9 | R210 | L6 | R522 | I7 | R610 | J3 | R6C1 | J3 | ZD609 | K2 |
| | | C279 | K4 | C562 | H5 | C623 | K3 | IC5A1 | K9 | R211 | M8 | R523 | I9 | R611 | J3 | R6C6 | M3 | ZD610 | K2 |
| | | C280 | K4 | C563 | G7 | C624 | J3 | IC5K1 | H5 | R212 | L7 | R524 | I9 | R612 | J3 | R6C7 | M3 | ZD611 | J2 |
| | | C281 | L4 | C564 | H8 | C626 | I4 | IC5K2 | H4 | R213 | L7 | R525 | I9 | R613 | J3 | R6C8 | J2 | ZD612 | J2 |
| | | C282 | K5 | C565 | I9 | C627 | I4 | IC601 | J4 | R214 | L7 | R526 | H9 | R614 | J3 | R6C9 | K2 | ZD6T0 | M1 |
| | | C283 | K5 | C566 | I9 | C628 | H4 | IC602 | J3 | R215 | L7 | R527 | I9 | R615 | J3 | R6D1 | M3 | ZD6T1 | M1 |
| | | C291 | L4 | C567 | I9 | C629 | H4 | IC603 | I4 | R216 | L7 | R528 | I9 | R616 | J3 | R6T0 | M2 | | |
| | | C292 | K6 | C568 | I9 | C630 | I4 | IC604 | H3 | R217 | M8 | R529 | I9 | R617 | J3 | R6T1 | M1 | | |
| | | C293 | L6 | C569 | H9 | C631 | I4 | IC605 | K8 | R218 | M8 | R532 | H5 | R618 | J3 | R6T2 | M2 | | |
| | | C295 | J5 | C570 | H5 | C632 | I4 | J6 | I8 | R219 | L6 | R533 | H5 | R619 | K3 | R6U0 | L2 | | |
| | | C502 | K6 | C571 | G5 | C633 | I3 | JK601 | J1 | R220 | L6 | R534 | J8 | R620 | J3 | R6U1 | L2 | | |
| | | C503 | K6 | C572 | H5 | C634 | H3 | JK602 | H1 | R221 | L6 | R535 | J8 | R621 | J2 | R6U2 | L2 | | |
| | | C504 | K6 | C573 | G5 | C635 | I3 | JK603 | M1 | R222 | L5 | R536 | H5 | R622 | J2 | R6W1 | G2 | | |
| | | C505 | K6 | C574 | I6 | C636 | I3 | L201 | L6 | R231 | M8 | R537 | H5 | R623 | J2 | R6W2 | G2 | | |

## 2. KEY P.C.BOARD

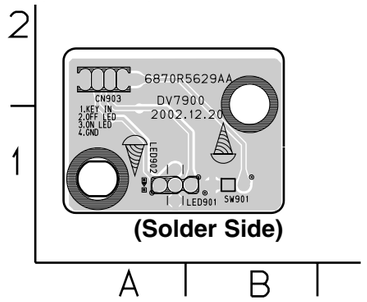
**( 7 TOOL )**




**( 8 TOOL )**

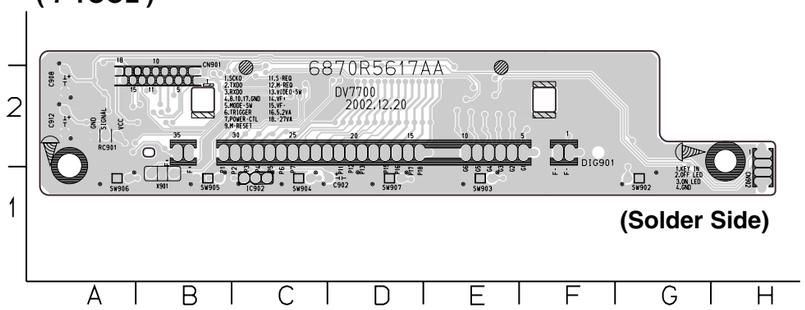



**( 9 TOOL )**




## 3. TIMER P.C.BOARD

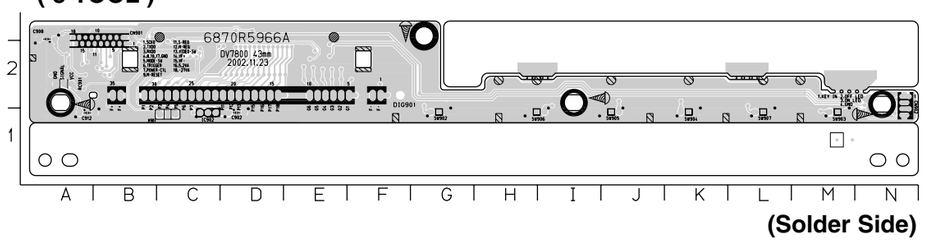
**( 7 TOOL )**




LOCATION GUIDE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| C902 | D1 | Q902 | E2 | R918 | E2 | R936 | C2 |
| C905 | D3 | R901 | G2 | R919 | F2 | R937 | B2 |
| C906 | D3 | R902 | G2 | R920 | E2 | R938 | B3 |
| C907 | C3 | R903 | E1 | R921 | D2 | R944 | A2 |
| C908 | A2 | R904 | C1 | R922 | D2 | R945 | A2 |
| C909 | C2 | R905 | C1 | R923 | D2 | R951 | E2 |
| C910 | A2 | R906 | E1 | R924 | D2 | R952 | E2 |
| C911 | F2 | R907 | D1 | R925 | D2 | R953 | B3 |
| C912 | A2 | R908 | D3 | R926 | D2 | R9S1 | G1 |
| C913 | B1 | R909 | D3 | R927 | D2 | RC901 | A2 |
| CN901 | B2 | R910 | C1 | R928 | D2 | SW902 | G1 |
| CN902 | H2 | R911 | A2 | R929 | D2 | SW903 | E1 |
| DIG901 | F2 | R912 | F2 | R930 | D2 | SW904 | C1 |
| IC901 | C2 | R913 | F2 | R931 | D2 | SW905 | B1 |
| IC902 | C1 | R914 | E2 | R932 | D2 | SW906 | A1 |
| L901 | A2 | R915 | E2 | R933 | C2 | SW907 | D1 |
| L902 | C3 | R916 | E2 | R934 | C2 | X901 | B1 |
| Q901 | E2 | R917 | E2 | R935 | C2 | | |

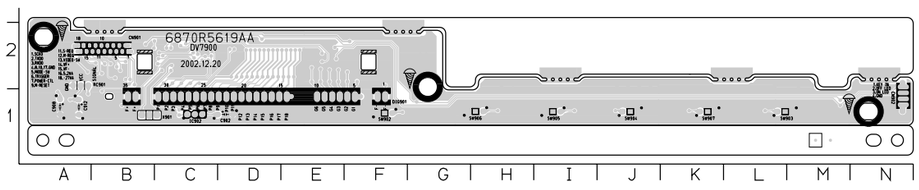
**( 8 TOOL )**




LOCATION GUIDE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| C902 | D1 | Q902 | E2 | R917 | E2 | R935 | C2 |
| C905 | D3 | R901 | G2 | R918 | E2 | R936 | B2 |
| C906 | D3 | R902 | K2 | R919 | F2 | R937 | B2 |
| C907 | C3 | R903 | K2 | R920 | E2 | R938 | B3 |
| C908 | A3 | R904 | J2 | R921 | D2 | R944 | A2 |
| C909 | C2 | R905 | J2 | R922 | D2 | R945 | A2 |
| C910 | B2 | R906 | J1 | R923 | D2 | R951 | E2 |
| C911 | F2 | R907 | K1 | R924 | D2 | R952 | E2 |
| C912 | A1 | R908 | D3 | R925 | D2 | R953 | C3 |
| C913 | C1 | R909 | D3 | R926 | D2 | R951 | M2 |
| CN901 | B2 | R910 | C1 | R927 | D2 | RC901 | A2 |
| CN902 | N2 | R911 | A2 | R928 | D2 | SW902 | G1 |
| DIG901 | F2 | R912 | F2 | R929 | D2 | SW903 | M1 |
| IC901 | C2 | R913 | F2 | R930 | D2 | SW904 | K1 |
| IC902 | C1 | R914 | E2 | R931 | D2 | SW905 | J1 |
| L901 | A2 | R915 | E2 | R932 | D2 | SW906 | H1 |
| L902 | B3 | R916 | E2 | R933 | C2 | SW907 | L1 |
| Q901 | E2 | | | R934 | C2 | X901 | C1 |

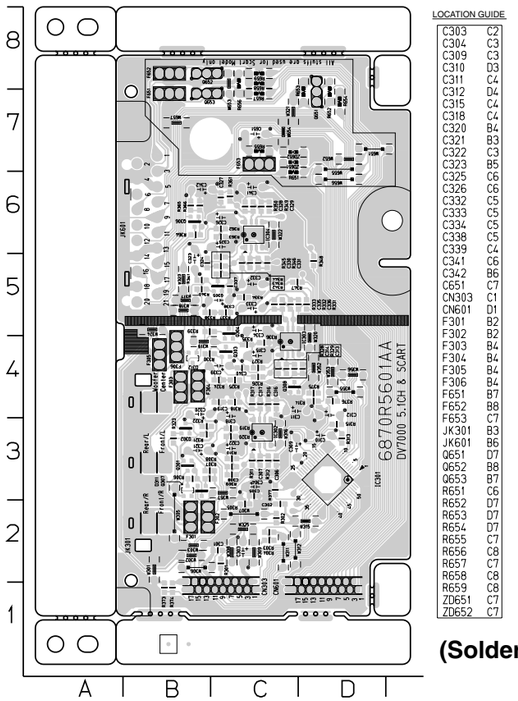
**( 9 TOOL )**




LOCATION GUIDE

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| C902 | B1 | Q902 | F2 | R917 | E2 | R935 | C2 |
| C905 | D2 | R901 | G1 | R918 | F2 | R936 | C2 |
| C906 | D2 | R902 | G1 | R919 | F2 | R937 | C2 |
| C907 | C2 | R903 | J1 | R920 | E2 | R938 | C2 |
| C908 | A1 | R904 | I1 | R921 | E2 | R944 | A1 |
| C909 | D2 | R905 | I1 | R922 | E2 | R945 | A1 |
| C910 | B1 | R906 | I1 | R923 | D2 | R951 | E2 |
| C911 | F2 | R907 | J1 | R924 | D2 | R952 | E2 |
| C912 | A1 | R908 | D2 | R925 | D2 | R953 | B2 |
| C913 | C1 | R909 | D2 | R926 | D2 | R951 | M1 |
| CN901 | B2 | R910 | C1 | R927 | D2 | RC901 | A2 |
| CN902 | N2 | R911 | A1 | R928 | D2 | SW902 | F1 |
| DIG901 | F1 | R912 | F2 | R929 | D2 | SW903 | L1 |
| IC901 | C2 | R913 | F2 | R930 | D2 | SW904 | J1 |
| IC902 | C1 | R914 | E2 | R931 | D2 | SW905 | I1 |
| L901 | A2 | R915 | E2 | R932 | D2 | SW906 | H1 |
| L902 | C2 | R916 | E2 | R933 | C2 | SW907 | K1 |
| Q901 | F2 | | | R934 | C2 | X901 | B1 |

## 4. SCART & 5.1CH P.C.BOARD(OPTIONAL PART)

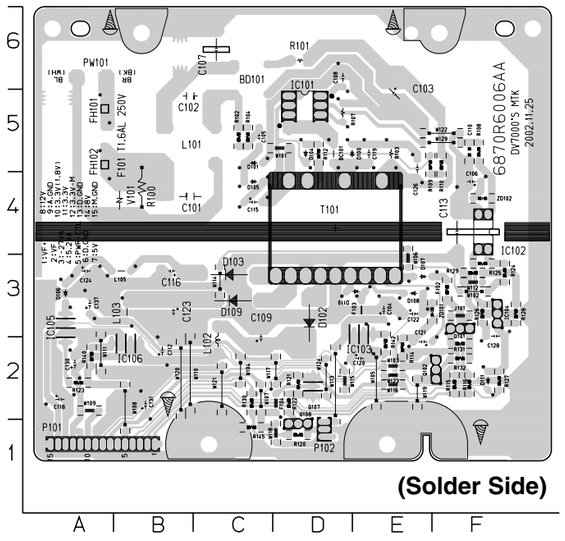



(Solder Side)

LOCATION GUIDE

| | |
|---|---|
| C303 | C2 |
| C304 | C3 |
| C309 | C3 |
| C310 | D3 |
| C311 | C4 |
| C312 | D4 |
| C315 | C4 |
| C318 | C4 |
| C320 | B4 |
| C321 | B3 |
| C322 | C3 |
| C323 | B5 |
| C325 | C6 |
| C326 | C6 |
| C332 | C5 |
| C333 | C5 |
| C334 | C5 |
| C338 | C5 |
| C339 | C4 |
| C341 | C6 |
| C342 | B6 |
| C651 | C7 |
| CN303 | C1 |
| CN601 | D1 |
| F301 | B2 |
| F302 | B2 |
| F303 | B4 |
| F304 | B4 |
| F305 | B4 |
| F306 | B4 |
| F651 | B7 |
| F652 | B8 |
| F653 | C7 |
| JK301 | B3 |
| JK601 | B6 |
| Q651 | D7 |
| Q652 | B8 |
| Q653 | B7 |
| R651 | C6 |
| R652 | D7 |
| R653 | D7 |
| R654 | D7 |
| R655 | C7 |
| R656 | C8 |
| R657 | C7 |
| R658 | C8 |
| R659 | C8 |
| ZD651 | C7 |
| ZD652 | C7 |

## 5. POWER P.C.BOARD

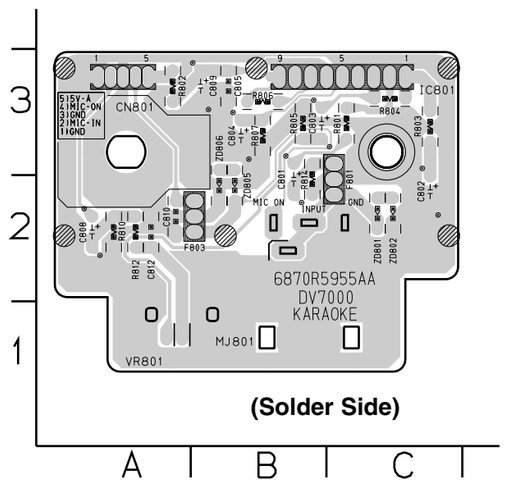



(Solder Side)

LOACTION GUIDE

| | | | | | |
|---|---|---|---|---|---|
| BC101 | D5 | D104 | D5 | R101 | D6 |
| BD101 | C6 | D105 | C4 | R102 | C5 |
| C101 | B4 | D106 | A3 | R103 | E5 |
| C102 | B5 | D107 | E3 | R104 | C5 |
| C103 | E5 | D108 | E3 | R107 | D5 |
| C104 | E3 | D109 | C3 | R108 | F5 |
| C105 | C5 | D110 | E3 | R109 | E5 |
| C106 | F4 | D111 | F2 | R110 | F5 |
| C107 | C6 | F102 | F3 | R112 | D5 |
| C108 | D6 | F103 | E3 | R114 | E2 |
| C109 | C2 | F104 | D2 | R115 | F2 |
| C110 | F5 | FH101 | A5 | R116 | F2 |
| C112 | B2 | FH102 | A5 | R120 | D1 |
| C113 | F4 | IC101 | D5 | R121 | D2 |
| C115 | C4 | IC102 | F4 | R122 | D2 |
| C116 | B3 | IC103 | D3 | R123 | A2 |
| C118 | A2 | IC104 | F3 | R124 | F3 |
| C119 | E5 | IC105 | A3 | R125 | F3 |
| C120 | E2 | IC106 | B2 | R126 | F3 |
| C121 | E2 | J101 | F3 | R127 | F2 |
| C122 | E3 | L101 | B5 | R128 | G3 |
| C123 | B3 | L102 | C2 | R129 | F3 |
| C124 | A3 | L103 | B3 | R130 | C2 |
| C126 | E5 | L105 | B3 | R131 | F2 |
| C128 | F3 | P101 | B1 | R132 | F2 |
| C130 | A2 | P102 | D1 | R140 | A2 |
| C131 | B2 | PW101 | A6 | R142 | E2 |
| C137 | A3 | Q101 | F3 | R145 | C1 |
| D100 | D5 | Q102 | F2 | T101 | D4 |
| D101 | C5 | Q107 | D2 | V101 | B4 |
| D102 | D3 | Q108 | D1 | ZD101 | F3 |
| D103 | C3 | R100 | B4 | ZD102 | F4 |

## 6. KARAOKE P.C.BOARD (KARAOKE MODEL ONLY)




(Solder Side)

LOCATION GUIDE

| | |
|---|---|
| C801 | B2 |
| C802 | C2 |
| C803 | B3 |
| C804 | B3 |
| C805 | B3 |
| C808 | A2 |
| C809 | B3 |
| C810 | A2 |
| C812 | A2 |
| CN801 | A3 |
| F801 | C2 |
| F803 | B2 |
| IC801 | C3 |
| MJ801 | B2 |
| R801 | C3 |
| R802 | A3 |
| R803 | C3 |
| R804 | C3 |
| R805 | B3 |
| R806 | B3 |
| R807 | B3 |
| R810 | A2 |
| R812 | A2 |
| R814 | B2 |
| VR801 | A1 |
| ZD801 | C2 |
| ZD802 | C2 |
| ZD805 | B2 |
| ZD806 | B2 |